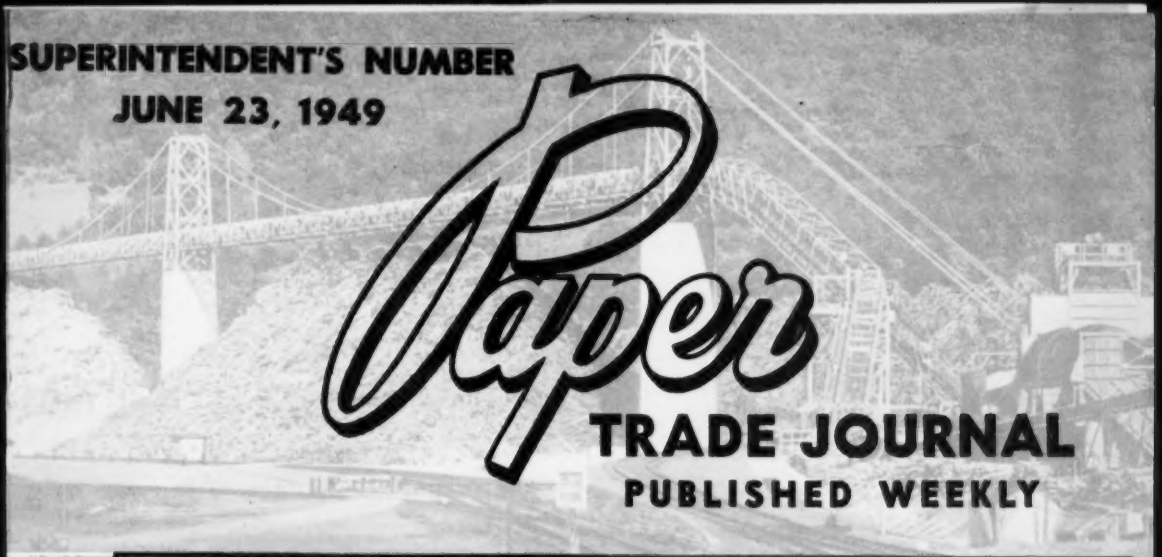
SUPERINTENDENT'S NUMBER
JUNE 23, 1949



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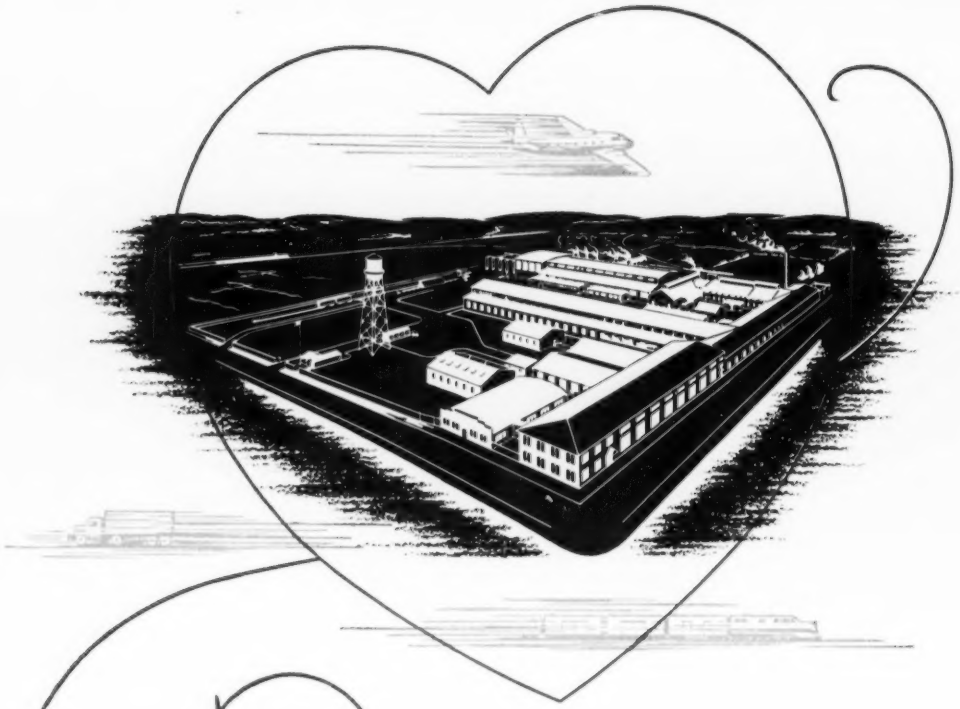

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What does this mean to you? Papermaking and its machinery is the heritage of most of our employees, their forefathers having been "in the business." Further, as you realize, no paper machinery manufacturer makes everything that goes into the final assembly of "almost anything" you order—some typical examples being anti-friction bearings, wire and rubber covering for rolls.

Our location, "In the Heart of Suppliers," makes it easy to obtain quickly whatever is needed for your order. Also, the engineering departments of suppliers are handy for consultation on new problems. Further, though "Praise Allah it may never happen," we are strategically located to give immediate action on breakdown repairs, no matter where you are.

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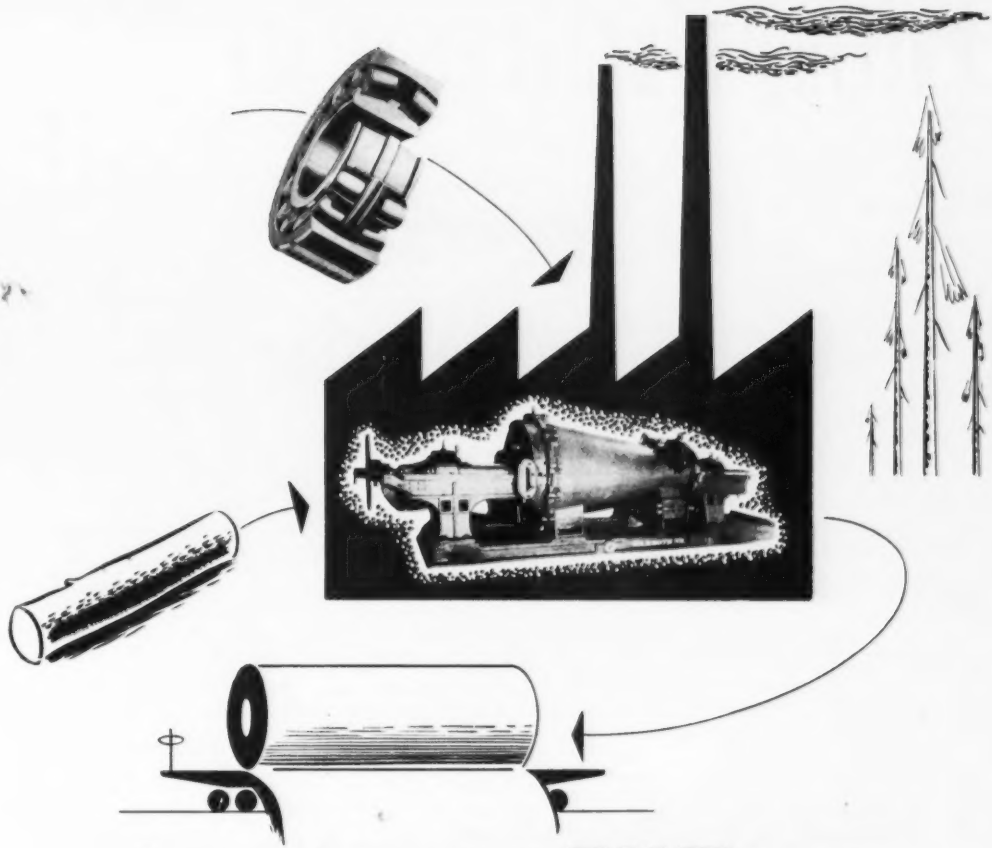

from wood to paper on SKF Bearings

At almost every step in the manufacture of paper . . . SKF Bearings play a vital part. Thousands of these bearings are now serving the paper mill field in pulp grinders, chippers, beaters, Jordan engines and paper machines.

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Our engineers are prepared to help you with your bearing applications. SKF Industries, Inc., Philadelphia 32, Pa. 6638

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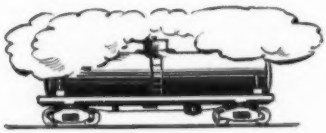


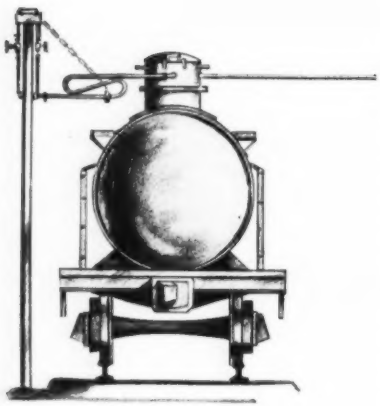
on Chlorine

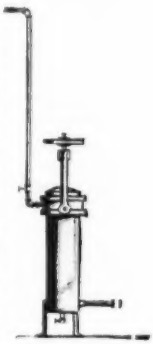
The development of a chlorine evaporator that maintained a constant gas temperature solved only a portion of the chlorine flow problem. Hooker engineers next tackled the problem of keeping the pressure constant. This was solved by applying regulated air pressure to the liquid chlorine in the tank car.

A relatively simple air cooler and drier was designed and constructed to operate in conjunction with an automatically regulated air compressor.

Another problem, that of preventing the corrosive action created by the backflow of chlorine in the air system, was also solved. To prevent this backflow, a new check valve was developed with two 7½ pound plungers. These plungers placed a mechanical pressure on the seat of the valve at the time of closure and assured a greater degree of safety against leakage of chlorine. The sum total of the two plungers being 15 pounds, pressure of the air system was maintained at 15 pounds higher than the pressure of the chlorine system.

These advances in the safe and convenient handling of chlorine are only part of the story of Hooker's long and close relationship with the pulp and paper industry. Hooker continues to provide helpful service by supplying uniform high quality chlorine, caustic soda and other chemicals. For your pulp and paper making you can always depend upon Hooker Chemicals.





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MEMBER

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Paper TRADE JOURNAL

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, June 22, 1949.

Wood Pulp

Awaited announcement of Weyerhaeuser Timber Co.'s third quarter prices made on June 17 started a downward trek of bleached sulfite and bleached kraft prices varying from 6 to 10 percent which other producers were quick to join. Price of bleached sulfite was cut $8 to $118, bleached kraft $14 to $122. Other U. S. bleached sulfites appear to have firmed at $118, while one other brand of the bleached kraft is priced at $128.

West coast unbleached sulfite will be priced late this week, following which full range of prices should be available from all agents.

Softening of Bleached Soda is thought likely, Groundwood, already soft in supply, is quoted at $60/65.

Though news of Swedish prices is as yet partial, it appears that bleached kraft will be $125/126, bleached sulfite $118, unbleached kraft $94.

For the most part, Canadian prices have not yet been quoted. Two quotations for bleached sulfite may or may not indicate the trend at $118 delivered. Unbleached kraft varies from $95 with $12.50 maximum transportation allowance, to $105 delivered. Only known price for bleached kraft is early June figure of $130 with $12.50 maximum transportation allowance.

Decision on Norwegian bleached sulfite price is being deferred. Finnish quotations will move down to meet domestic grades.

Contributing to the weakness in market pulp price is trend in pulpwood price toward lower levels, the U. S. Dept. of Commerce June report states. "In the Pacific Northwest, prices have generally weakened, but declines have been small and relatively negligible. In some areas of the South, recent price drops have ranged from 50c per cord upward, the average decline approximating $1 per cord. In the northern portion of the country, poplar is reportedly available at reductions up to $2 per cord delivered at the mill. In the Lake states, prices for balsam and spruce cut by independent contractors or farmers are reportedly down $4 to $5 per cord, in comparison with those prevailing at the 1948 year's end."

The 19.5 percent drop in non-integrated consumption of market pulp in the first quarter of the year, and a drop of 18 percent in purchased pulp inventories (445,000 tons) explain the weakness in the market pulp situation, says the Department's report. Departing from the "average" mill inventory are those which have been running close to production requirements for some months and buying pulp substitutes on a *daily manna* basis, waiting for market pulp prices on which they could compete with integrated paper prices. Some pickup in buying by this group has already been noted, although general evaluation of the market followed by quantity buying is not expected to get under way before mill vacations. It is anticipated that these new reductions will so stabilize the market that buying for inventory can be resumed with confidence. Queried as to the probability of producers setting their prices for longer periods than the three months their contracts call for, or stating that prices are unlikely to change for the balance of the year—a moot question among importers—mill representatives candidly say that what the U. S. industry needs is not statements but hard selling in the paper mart.

Waste Paper

Contraction of wood pulp prices to these new levels will work further hardships on the already badly-shattered waste paper market, the dealers fear, since there are price levels below which members of the trade cannot operate profitably. However, greatest weakness in that market has been in the low bulky's and in *news* and corrugated. Some strengthening of corrugated was reported last week, along with other types of kraft waste. And while mills continue to face the challenge of competitive prices, it is held that a strong market for waste paper substitutes must exist. That some reductions will become desirable in the high grades is a foregone conclusion, in view of price cuts in bleached sulfites.

Grave problems confronting the waste paper industry have precipitated a joint request for Government assistance. Salient points of letter sent to Secy. of Commerce Charles Sawyer, and reported in full elsewhere in this issue, asks that a program be instituted to allocate wood pulp so that forests will be preserved and waste paper utilized; that waste paper be sold to foreign markets under the Marshall Plan; abolishment of the ECC and investigation of its activities; a fact-finding investigation of the use of children in creating a waste paper surplus which destroys a regular peacetime business operation.

Among other important problems facing waste paper dealers and mills is that of creating a constant market for the salvage of used multiwall bags, all made of the best grade of kraft paper. Inclusion of asphalt laminated sheets, wet-strength, waxed, coated or impregnated papers in packings of used kraft bags present major problems to consuming mills. Programs to induce

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- Under one contract and one responsibility, we deliver jobs complete, ready for operation.
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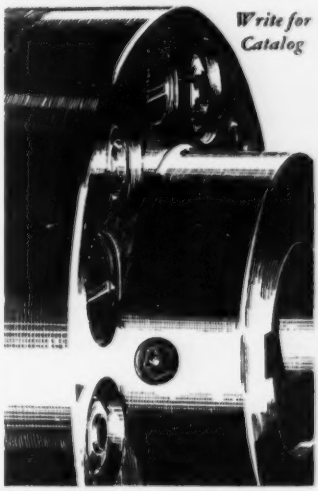

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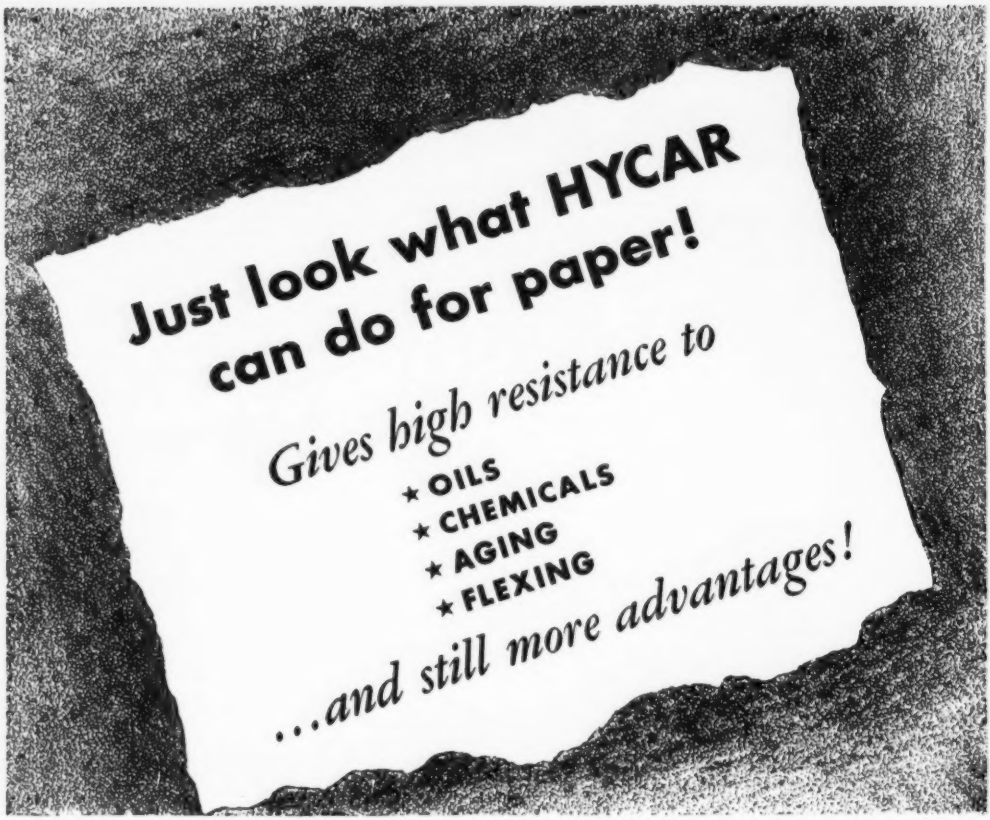

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We will be glad to work with you on applications or problems relating to the use of Hycar latex. For more information, please write Dept. HH-7, B. F. Goodrich Chemical Company, Rose Bldg., Cleveland 15, Ohio.

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bakers to throw away all bags except those containing flour, cane or beet sugar were inaugurated at spring session of the Waste Paper Institute. The problem is a packers' headache but pays off, the market for used kraft bags ranging from $20 to $25 to those of special pack sold as New Brown Kraft Cuts at $40 to $45.

Newsprint

Newspaper advertising in the U. S. 52 cities was 3.5 percent higher in the first four months of 1949 than in like months of 1948.

Consumption of newsprint by dailies reporting to the ANPA during May rose to 392,212 tons, the greatest consumption ever recorded during any one month. Total estimated U. S. consumption was 496,471 tons, which includes all kinds of uses of newsprint.

Consumers' stocks, on hand and in transit at the end of May, 1949, declined to 35 days supply, for the average of all dailies reporting to the ANPA, a drop of three days compared with April, 1949, but an increase of two days over May, 1948.

North American mill stocks at the close of May were 841,708 tons, compared with 673,758 tons at the end of May, 1948, the Newsprint Assn. of Canada reports.

Total U.S. supply was 478,091 tons, compared with 451,431 tons in May, 1948. About 79 percent of total U.S. supply in May came from Canadian mills, about 15.8 from U.S. mills, and 5.2 percent from Europe. U.S. production was 76,723 tons, an increase of 1.2 percent; Canadian, 442,730 tons, an increase of 5.2 percent over May, 1948. U.S. imports from Europe were estimated at 24,600 tons, a decrease of 7 percent over May, 1948.

Indexes

Index of general business activity for the week ended June 11 rose to 144.9 from 140.8 in the preceding week, compared with 151.3 in the corresponding week of 1948. Index of paper board production climbed to 173.3 from 161.9 in the preceding week, compared with 197.4 in the corresponding week of 1948.

Comparative ratios of U.S. paper and paperboard production to mill capacity, as reported by AP&PA are:

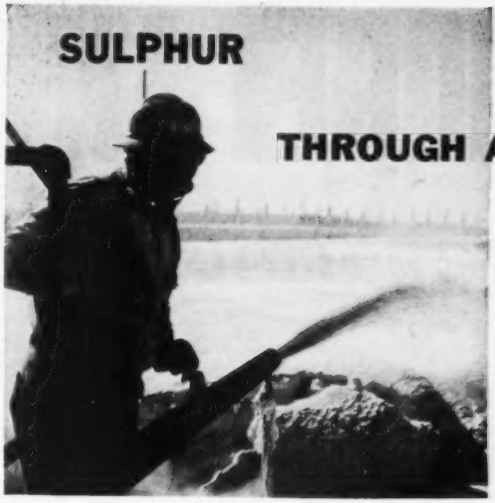
	June 11 1949	June 4 1949	June 12 1948	June 14 1947	June 15 1946
Paper**	83.8	79.7	95.0	107.2	104.0
Paperboard ..	79.0	65.0	101.0	103.0	98.0

** Capacity in tons: 179,776; 1948, 179,802.
‡ Revised.

Paperboard Production (Tons)

	June 11 1949	June 4 1949	June 12 1948
Production	165,729	137,521	193,156
New Orders	153,108	183,749	171,337
Unfilled Orders ...	272,243	283,585	380,421

Percent of Activity, Current, 79%; Year, 81%.



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—You can readily adapt this flexible drive to suit machine conditions, with motor connected to the line shaft directly by belts or chains, or through speed reducers.

—Installation is simple, maintenance costs low, service continuity high.

—Easy installation adjustment permits close tuning of the drive to any combination of inertia and friction loads.

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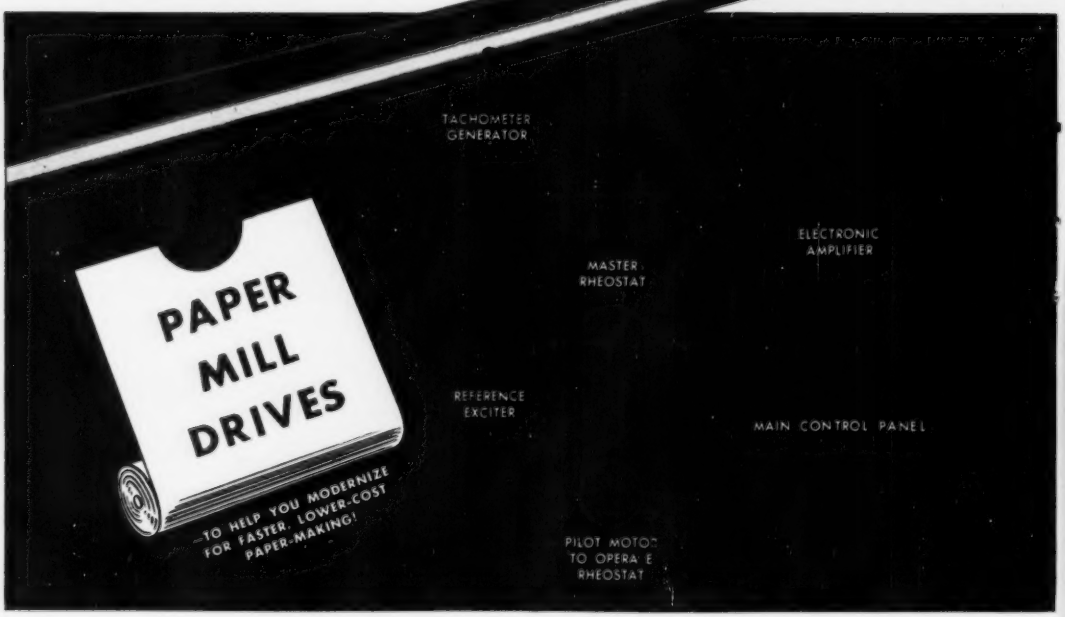

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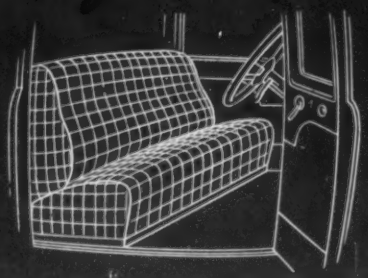

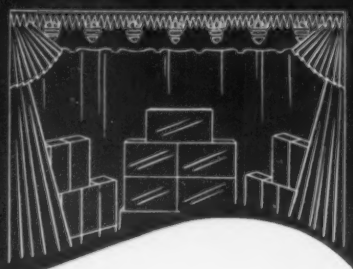

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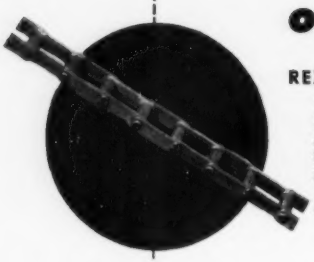
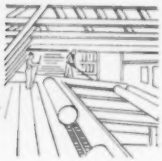
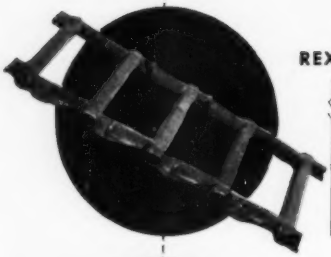
on REX pulp mill chains



REX COMBINATION AND DUROBAR CHAINS

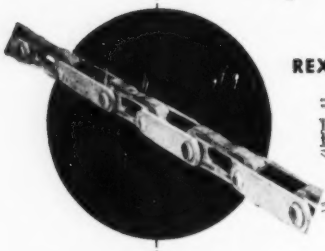


are husky chains with inside block links of malleable iron or Rex Z-Metal and side bars blanked from high carbon steel. Side bar pin holes are accurately punched for correct pitch and good drive fits. Milled flats on the ends of the pins prevent turning in the side bars and prolong chain life. Durobar Chains have reinforced outer barrel faces which eliminate rolling, grinding contact with sprocket teeth and thus reduce chain wear.

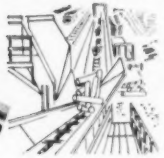


REX H-TYPE CONVEYOR CHAINS

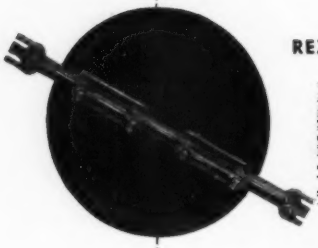
offer an efficient, economical means for conveying slabs, sawdust and other mill refuse. Operating in shallow troughs, these chains, because of their great width, offer the advantage of large capacity at low speeds. Chain links are one-piece castings. Inner barrel faces are designed for smooth operation over sprockets. Outer barrel faces are designed to act as scrapers. Wide wearing shoes, cast on the side bars, take the sliding wear, and vertical lugs reinforce and protect rivet ends.



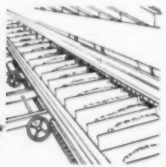
REX MILL REFUSE AND LOG CONVEYOR CHAINS



are stronger, tougher chains designed specifically for longer life under the pounding of logs and slabs. Alternating wide cast block links and steel side bar links combine rugged strength and a large sliding surface as well as maximum bearing area on the rivets. Cast block links are of heavy design, reinforced with two struts that provide a sturdy anchorage for scraper or chair attachments.



REX DROP FORGED CHAINS



are preferred for log haul and refuse conveyor service where high strength and relatively low cost are desired. Drop Forged Chains are flexible in two directions, and assembly and disassembly can be made without the use of tools. Chain parts are forged from high carbon steel and are carefully designed for large bearing areas and wearing surfaces. Links can be turned over to provide a new sliding surface after long service.

For the complete story on the complete Rex line of pulp mill chains, call your Rex District Office or write direct for Catalog 48-27. Chain Belt Company, 1605 W. Bruce St., Milwaukee 4, Wis.

CHAIN BELT COMPANY REX

DRIVE AND CONVEYOR CHAINS

FIRST FOR LASTING SERVICE

now available from stock

PRINTED IN U.S.A.

Fire is Forest Enemy No. 1. In most years more trees are destroyed by fire than are harvested! And the pity of it all is that most fires are caused by human carelessness and ignorance of the far-reaching consequences. Nine out of ten fires can be traced to man. Careless smokers *alone* cause one out of four.

The men and management of Weyerhaeuser Timber Company are keenly alive to the necessity of protecting forest lands from fire. Since 1903 the Weyerhaeuser organization has been participating in cooperative fire protection efforts with other private forest owners and with State and Federal agencies.

Supplementing its fire protection activities, the Weyerhaeuser forestry management program also includes relentless insect and disease control throughout its extensive timber tracts and the company's eight thriving Tree Farms which are producing harvests for the future.

Furthered by this constructive forestry policy, the Pulp Division represents a reliable and continuing source of supply for consumers of bleached chemical woodpulp.

YES! GO WEST!

1949 Fall Meeting TAPPI, Portland, Oregon

PULP DIVISION

WEYERHAEUSER

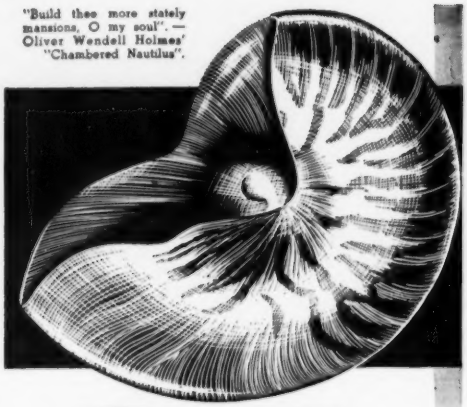
GROWTH

It won't be long, little fellow, till you'll be wishing you were young again.

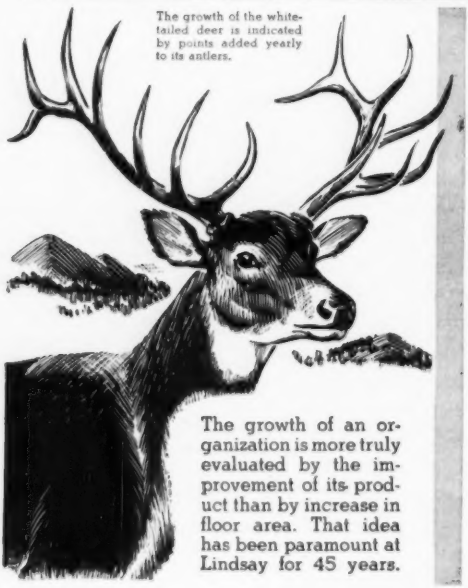
"Time is the measure of a successful business enterprise, as money is the measure of wares"*. Lindsay hopes to serve the manufacturers of paper faithfully for many years more.

*Adapted from Sir Francis Bacon

"Build thee more stately mansions, O my soul". — Oliver Wendell Holmes' "Chambered Nautilus".



The only worthy industrial expansion is that which is founded upon the quality of the product manufactured. That thought has been behind the growth which has been enjoyed by Lindsay for 45 years.



The growth of the white-tailed deer is indicated by points added yearly to its antlers.

The growth of an organization is more truly evaluated by the improvement of its product than by increase in floor area. That idea has been paramount at Lindsay for 45 years.

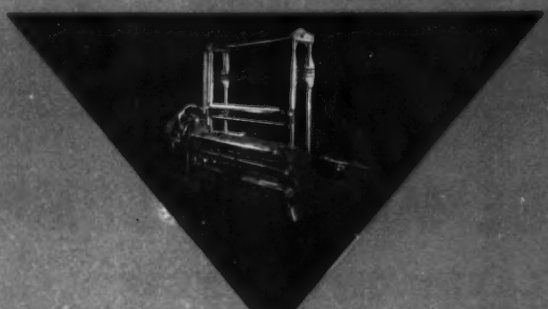
The tree rings show that this Douglas fir started its career in 1073 and was felled in 1260.

Sound growth in an industrial organization, like that of a tree, must be accomplished from the inside out. That principle has been a cardinal policy at Lindsay for 45 years.

The LINDSAY WIRE WEAVING Company 14001-14299 Aspinwall Avenue Cleveland 10, Ohio

balance: *an equality of weight, power advantage*

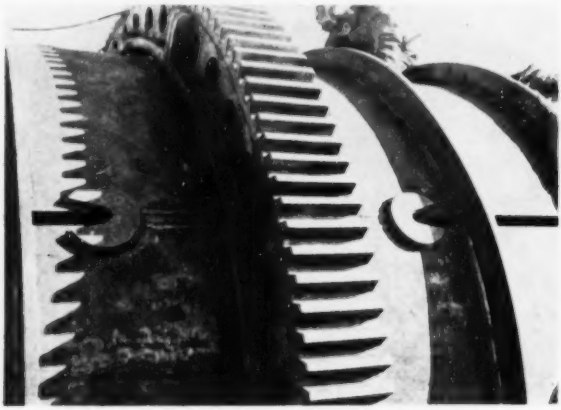
Substantially built from bed plate up, Langston Slitters and Roll Winders provide the balanced power that produces highest quality rolls. Samuel M. Langston Company, Camden, N. J.



Langston

SLITTERS AND ROLL WINDERS

Calling Your Attention To—

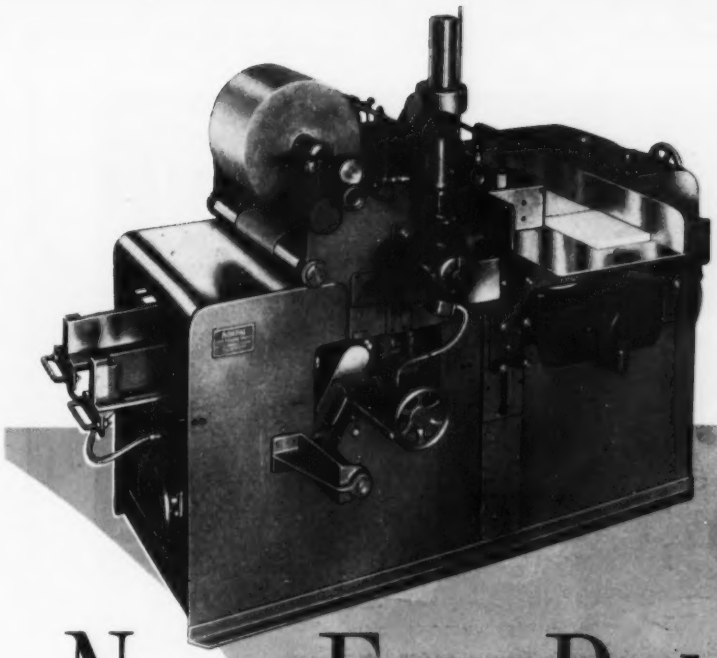


THE CARTHAGE BARKING DRUM

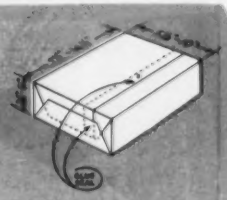
- ALL WELDED FULL LENGTH PLATE CONSTRUCTION
- NO RIVETS—BOLTS USED ONLY IN RING GEAR
- POUNDING ABSORBED BY WHOLE MASS OF DRUM
- SIMPLIFIED EIGHT BEARING CHASSIS
- 72" TRUNNIONS

CARTHAGE MACHINE COMPANY

CARTHAGE, NEW YORK



Dimensions below indicate the size range of Lynch MORPAC. All packages have the same neat appearance—square corners, trim edges and folds, properly sealed.



Neater, Faster Packaging

...with the LYNCH MORPAC PAPER PACKAGING MACHINE

Why wrap it by hand when Lynch MORPAC can wrap it faster, neater... and pay for itself quickly on any normal operation. Designed primarily for the graphic arts, Lynch MORPAC Paper Packaging Machine wraps or bands ream paper, tablets, pads, loose leaf fillers, books and most rectangular objects within its size range. Requiring only one operator, it wraps up to 1,000 packages per hour, saves from 30% to 40% per package on wrapper application.

Write for illustrated folder giving more details on how Lynch MORPAC Paper Packaging Machine helps reduce packaging costs.

PAR AIR COMPRESSORS

PAR REFRIGERATION COMPRESSORS

WRAP-O-MATIC CANDY & COOKIE WRAPPING MACHINES

LYNCH CORPORATION

PACKAGE MACHINERY DIVISION

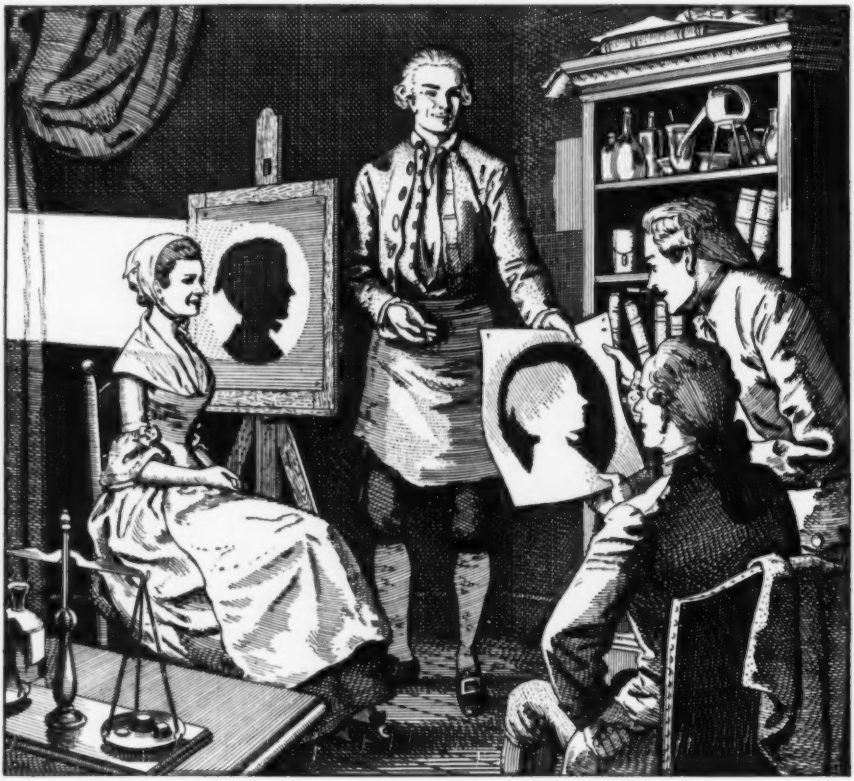
TOLEDO 1, OHIO U. S. A.

MORPAC BUTTER & OLEO PACKAGING MACHINES

MORPAC PAPER PACKAGING MACHINES

GLASS FORMING MACHINES

Yes! Go West! 1949 Fall Meeting TAPPI, Portland, Oregon.



The Secret Born in a Darkroom

In 1802 two Englishmen—Thomas Wedgwood and Sir Humphry Davy—published a paper that was to make history. They described how, in a darkened room, they had made profiles by casting shadows on paper moistened with nitrate of silver. But when exposed to light the silhouettes soon disappeared. Not until 1835 did another Englishman, W. H. Fox Talbot, devise a way to make a photographic image permanent. And it was more than a half-century later that George Eastman introduced his first small hand-held camera, followed it with transparent, flexible roll film and special papers, and made photography available to all.

Modern photography has vastly expanded printing and publishing, and has increased enormously the uses of paper in business, education, government, science, and the arts. Thus the secret born in a darkroom greatly stimulated the growth of America's paper industry.

The dramatic story of paper is told in the sound-and-color film, "Paper — Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request.

F. C. HUYCK & SONS · *Kenwood Mills* · RENSSELAER, N. Y.

KENWOOD WOOL PRODUCTS

HUYCK *Felts*

"I've never seen a strength report like this... what's your secret?"

"It's no secret... it's Cellate® and Brown Company technical service."

Cellate is the "strong man" in Brown Company's family of wood fibres. Papers destined to lead a busy life . . . maps, bags, envelopes, ledger sheets, for example, inherit rugged strength from Cellate pulps.

Where flexibility is important, along with maximum whiteness . . . there, too, Cellate is the pulp to choose. And helping you on such development problems will be our Technical Service Division . . . guiding your selection to assure the proper fibres and best process to achieve your objectives.

Experience in a diversified range of top industries . . . plus Brown Company's control of huge raw material resources . . . mean a quicker, more efficient solution to your problem when you get in touch with any of the sales offices below.

BROWN COMPANY

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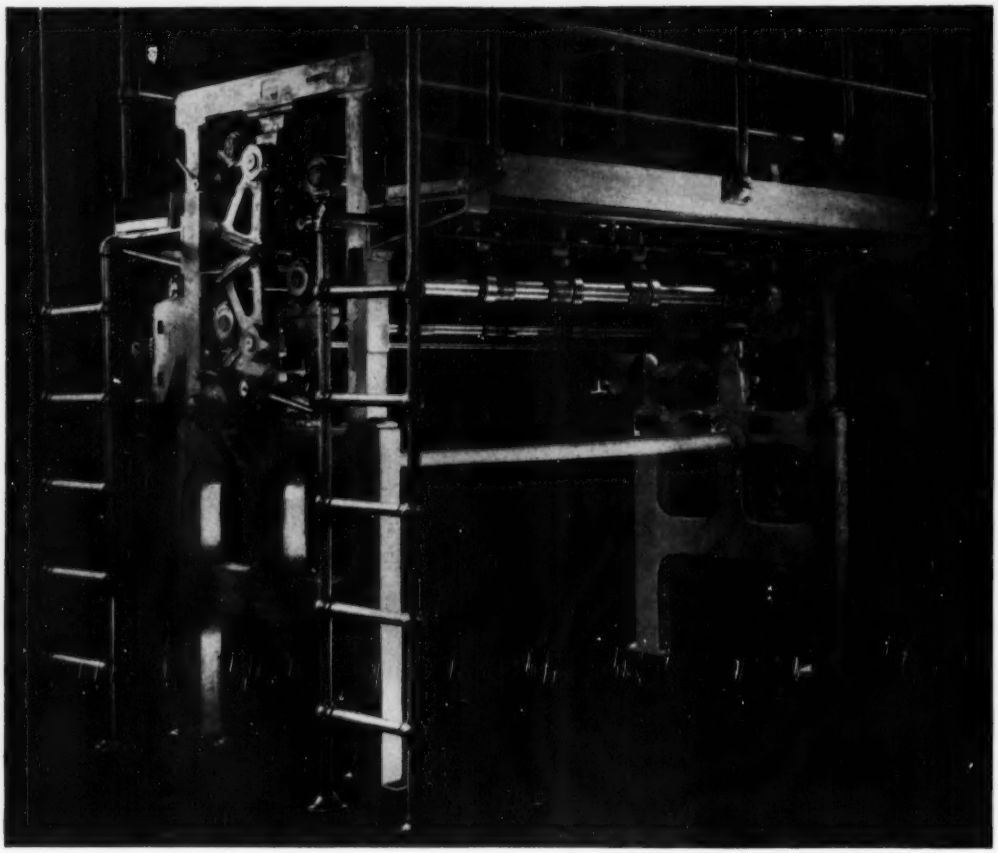
it's new–it's versatile–it's more efficient

Moore & White DUPLEX SLITTER



This slitter is built of box section frames, for hard continuous operation, and will efficiently handle 95 percent of the grades of paper and paperboard manufactured today. The unit can be operated with practically any type of sheeting equipment where fast change-over from one sheet-width to another is required. It eliminates shutdown time when changing sheet-width and also reduces waste due to resetting of slitters.

This unit, when combined with our new rotary sheet-cutters, permits continuous sheet operation. Changes of width and length of sizes are made without shutting down the combined units. The change-over from one slitter section to the other is fast, simple, and accurate.

Positive throwout of top slitter blades is accomplished through the use of a handle on each slitter section. One quarter-turn of the handle moves all blades in the section either in or out of normal operating position.

The slitter may be driven separately, from the sheet cutter, or direct from the paper machine line shaft. Each section is driven as a separate unit, complete with clutch to eliminate shock loads when change-over is made. All moving parts are encased in antifriction bearings.

The speed range of the new Moore & White Duplex Slitter will meet the needs of any sheeting equipment now in operation. It is built to standard widths of 50, 62, 72, 84, 110, and 124 inches. Additional widths are available in sizes to suit your requirements. Write today for complete information.

CUSTOM-BUILT MACHINES FOR MAKERS OF PAPER AND PAPERBOARD

The MOORE & WHITE Company

15TH STREET AND LEHIGH AVENUE • PHILADELPHIA 32, PA.

BARRELL'S

PAPER ANNUAL

1949-1950

Presented as a Service to Members of the Paper Industry

WILLIAM L. BARRELL COMPANY
LAWRENCE, MASSACHUSETTS

VOL. VIII
1949-1950

CONTENTS

Directory of Officials of 34 Paper Industry Associations and other features.

Sent to members of the Paper Industry

WILLIAM L. BARRELL COMPANY
Lawrence, Mass.

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BARRELL'S PAPER ANNUAL

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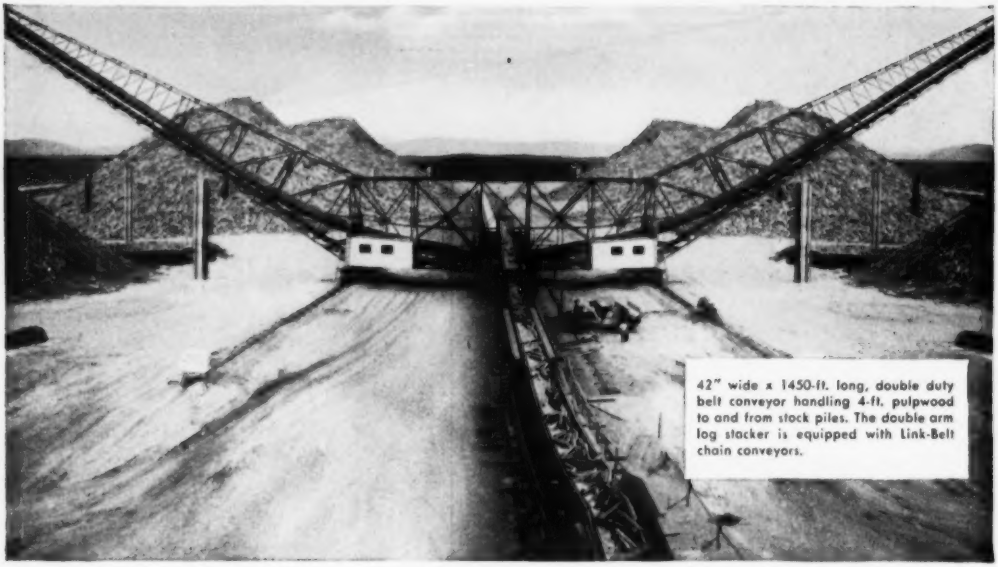


42" wide x 1450-ft. long, double duty belt conveyor handling 4-ft. pulpwood to and from stock piles. The double arm log stacker is equipped with Link-Belt chain conveyors.

AT LongLac . . . Pulpwood is moved *Efficiently with* LINK-BELT CONVEYORS & DRIVES

Log haulup and slasher equipped with 8 strands of TL-132 chain with spur attachments.

42" wide x 1600-ft. long belt conveyor handling 4-ft. pulpwood from slasher to wood room or storage.

Production requirements are met easily and economically with the installation of Link-Belt equipment at LongLac Pulp & Paper Co. Ltd., Terrace Bay, Ont.

For the mechanical handling of pulpwood from pond to slasher—to barkers and chippers —or to storage, the handling of wood chips, bulk chemicals, coal and the screening of intake water, Link-Belt equipment assures the benefit of the outstanding experience and facilities of the leading manufacturer of conveying and power transmission machinery.

Considerable Link-Belt power transmission machinery is used for driving conveyors and other types of equipment throughout the plant.

Link-Belt engineering advice and facilities are at your service. Address the nearest office.

11,514-A

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Houston 3, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8.
Offices in Principal Cities.

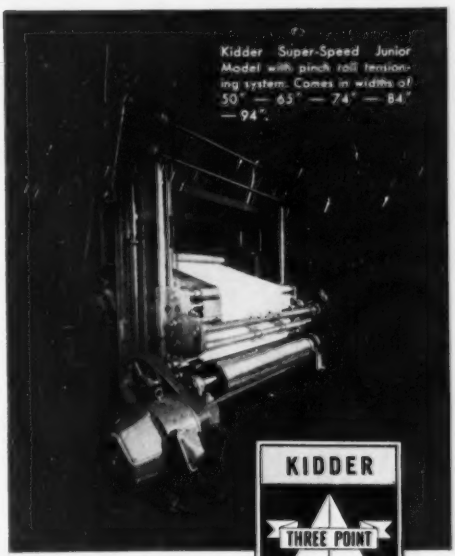
YES! GO WEST! 1949 FALL MEETING TAPPI—SEPT. 12-16—PORTLAND, OREGON.

Kidder Super-Speed Slitter with all-electric tension control. This control employs an electric motor operating as a generator in order to provide braking power for correct tensioning. Power generated is fed into main driving motor, thus cutting down on current consumption. Extremely accurate tension is maintained by this device.

CONSISTENTLY CLEAN CUTTING

...at 2,000 FPM!

Kidder Super-Speed Slitters feature the famous "scissors-action" shear cut principle because no other type of cutter gives such clean cutting day after day on the job. No other cutter performs as well for "mile after mile" of cutting because the hardened steel cutters have a self-sharpening effect *as they cut*. The fibres are actually *severed*, not merely crushed apart as in other cutting methods. A special paper spreader opens up the slit directly after cutting, assuring complete severance of fibres before rewinding.



Kidder Super-Speed Junior Model with pinch roll tensioning system. Comes in widths of 50" — 65" — 74" — 84" — 94".

All these advantages are yours when a Kidder Super-Speed Slitter goes to work for *YOU*:

1. Choice of widths . . . 80" — 90" — 100" — 110" — 120".
2. Large roll capacity . . . takes mill roll and rewind roll up to 50" in diameter.
3. Optional tensioning equipment . . . standard equipment is efficient, water-cooled brake . . . automatic electric or pinch roll types available on option.
4. Automatic roll ejection . . . booster quickly ejects roll at end of run.
5. Soft ends and wrinkles corrected . . . by bow bar as web leaves mill roll.

KIDDER PRESS COMPANY, INC.

DOVER, NEW HAMPSHIRE

KIDDER THREE POINT SLITTERS

give you

1. Clean, Accurate Cutting
2. High Speed, Dustless Operation
3. Easy Separation of Rolls

C. P. ROBINSON
Graybar Bldg., New York 17, N. Y.

MACHINERY SERVICE COMPANY
P. O. Box 33, Los Angeles 11, California

ONE SECTION OF OUR *Machine Shop* DEVOTED TO THE MANUFACTURE OF....

MURCO

PAPERMILL AND WOODROOM EQUIPMENT!

BACKED BY OVER 60 YEARS EXPERIENCE!

Shown here is one section of our modern Machine Shop engaged in processing a wide variety of papermill and woodroom equipment. In addition to modern machine facilities we offer the paper industry a complete service embracing engineering, pattern making and foundry operations that are top quality because of over sixty years close association with the needs of paper producers. Consult Murray when seeking modern machinery to meet today's need for high production at lower cost.

Level vibrating double deck chip screen.

Stainless Steel Flat Screen

Vertical Axial Flow Agitator

Pulp Wood Chipper

Horizontal Axial Flow Agitator

Chip Crusher

Stainless Steel Pipes and Fittings

Windenhahn

Quick opening gate valve

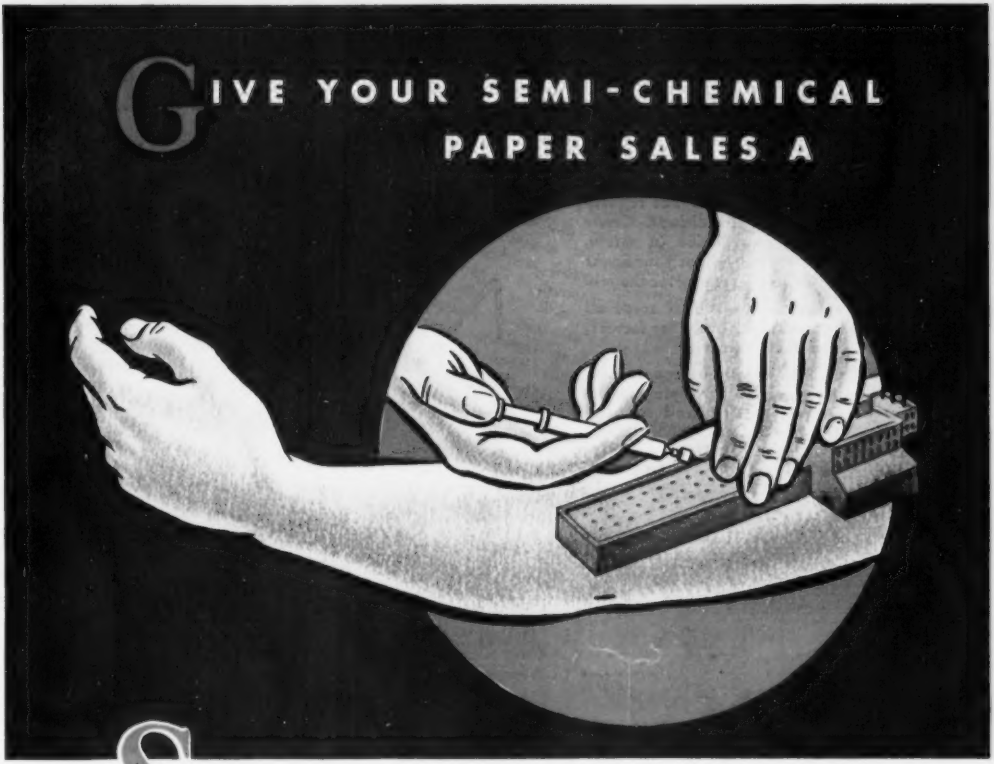
GRID UNIT HEATER AND BLAST COILS

Unit Heater

High test cast iron heating, drying and process equipment . . . one piece construction . . . no soldered, brazed or welded connections . . . no electrolysis to cause corrosion breakdowns, leaks or heating failures . . . may be safely used on steam pressures up to 250 lbs.

D. J. MURRAY MANUFACTURING CO.
WAUSAU · WIS.

GIVE YOUR SEMI-CHEMICAL PAPER SALES A



"Shot in the arm"...

• • • WITH HIGHER QUALITY

More beating is the answer to improved quality in your semi-chemical papers. Not only more beating but better beating. Sutherlands do this by producing a long fibre without the square, stocky fibre bundles, unavoidable with other methods.... Sutherlands have proven their ability to economically beat and thoroughly de-fibre coarse, semi-chemical pulps. This "better beating" improves formation, adds stiffness to your product, and increases strength, all with improved operating conditions on your paper machines.... The Sutherland is easy to operate, its power consumption is low, and it is ruggedly constructed to provide low maintenance. May we talk it over with you, or send our catalog?

SUTHERLAND REFINER CORPORATION · TRENTON, NEW JERSEY

Manufactured in the United States by Valley Iron Works Co., Appleton, Wisconsin

Sutherland Refiner Ltd., Windsor Hotel, Montreal, P. Q.

SUTHERLAND

Why buy piping the hard way When CRANE supplies everything?

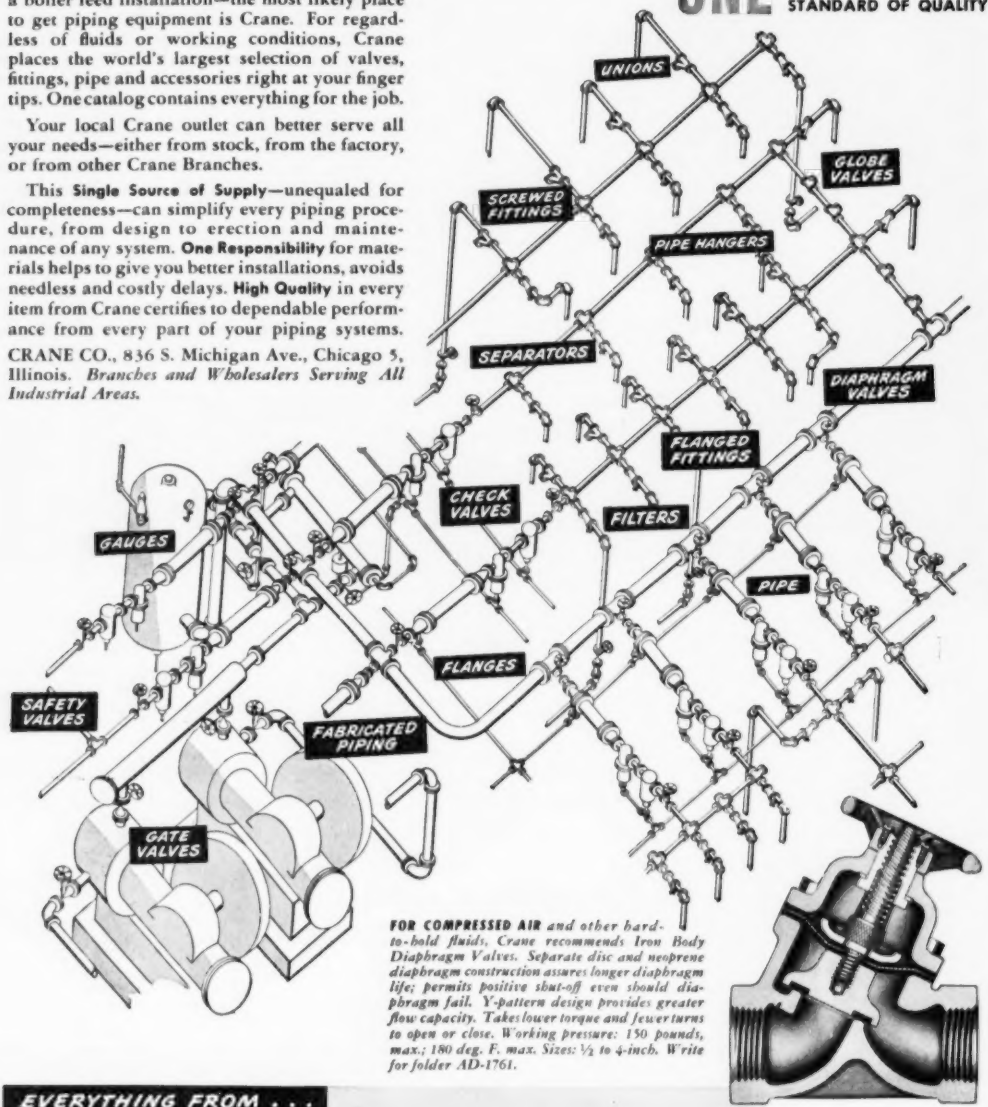
ONE SOURCE OF SUPPLY
RESPONSIBILITY
STANDARD OF QUALITY

For Air Service Piping—as for a superheater or a boiler feed installation—the most likely place to get piping equipment is Crane. For regardless of fluids or working conditions, Crane places the world's largest selection of valves, fittings, pipe and accessories right at your finger tips. One catalog contains everything for the job.

Your local Crane outlet can better serve all your needs—either from stock, from the factory, or from other Crane Branches.

This **Single Source of Supply**—unequaled for completeness—can simplify every piping procedure, from design to erection and maintenance of any system. **One Responsibility** for materials helps to give you better installations, avoids needless and costly delays. **High Quality** in every item from Crane certifies to dependable performance from every part of your piping systems.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Illinois. *Branches and Wholesalers Serving All Industrial Areas.*



FOR COMPRESSED AIR *and other hard-to-hold fluids, Crane recommends Iron Body Diaphragm Valves. Separate disc and neoprene diaphragm construction assures longer diaphragm life; permits positive shut-off even should diaphragm fail. Y-pattern design provides greater flow capacity. Takes lower torque and fewer turns to open or close. Working pressure: 150 pounds, max.; 180 deg. F. max. Sizes: ½ to 4-inch. Write for folder AD-1761.*

EVERYTHING FROM . . .

VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

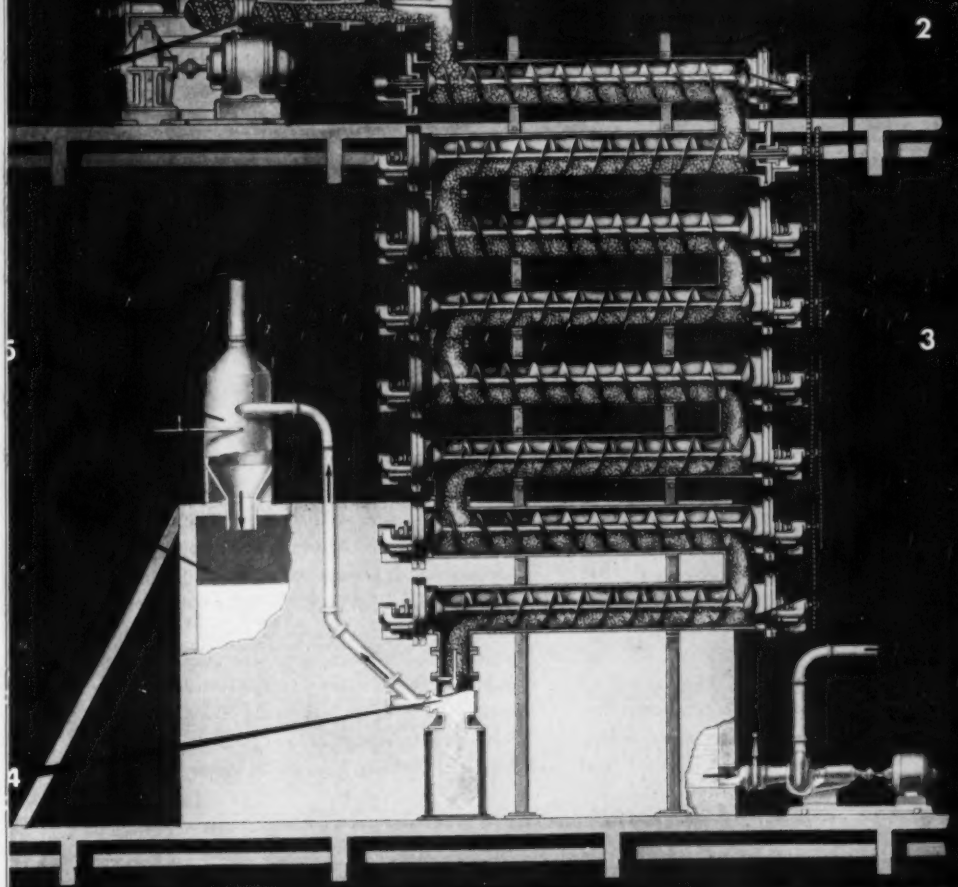
CRANE

FOR EVERY PIPING SYSTEM

CHEMIPULPER

WITH FOUR-UNIT REACTION CHAMBER
as used with the P and IA DISCHARGER

For continuous pulping, under controlled conditions, of chemical and non-chemical pulps. Discharges chemical or semi-chemical pulps to refiner of customer's choice. Quality and yield of pulp can be varied to meet specific requirements. Permits use of either hard or soft woods, or mixtures of such woods, to economically make pulps of predetermined quality. Saves steam, power, and chemical costs. Catalog upon request.



PAPER and INDUSTRIAL APPLIANCES, INC.
122 EAST 42nd STREET ● NEW YORK 17, N. Y.

got a job for DRIER ROLLS?

Here's how to do it faster

Lukenweld Jacketed Steel Rolls have helped dozens of companies speed up operations—heating or chilling materials to dry, crystallize, harden or otherwise condition them. Records covering hundreds of these rolls show production increases as high as 41% without increasing steam pressures. When pressures are elevated, production increases to over 60% can be achieved.

The jacketed, steel plate construction of Lukenweld Rolls does the trick. Steam, circulating through their narrow passages, moves at high speed; condensation is removed positively and continuously. Heat (or cold, if it's a chilling job) is transferred rapidly and uniformly through the comparatively thin but strong steel walls. Lukenweld Jacketed Steel Drier Rolls can be safely operated at pressures of 350 psi and higher.

Whether your job calls for rolls alone, an addition to present equipment or a complete new machine, Lukenweld engineers are prepared to engineer and build it for you. For such help, or for Bulletin 358 on Lukenweld Rolls, write Lukenweld, Division of Lukens Steel Company, 403 Lukens Building, Coatesville, Pennsylvania.

We'll lend you "LUKENWELD", a 16mm motion picture with sound, highlighting our methods, facilities and products. Running time: 20 minutes. Write for booking date.

LUKENS
LUKENWELD DIVISION

DESIGNERS, ENGINEERS AND MANUFACTURERS OF MACHINERY

THE NEW TYPE AH

* combination MOTOR STARTER for high-voltage motors with

new longer life

YOU CAN BE SURE... IF IT'S Westinghouse

Here is the answer to severe "repeater" duty motor starting—a combination starter for high-voltage motors that assures instant protection . . . that stands up to millions of start-stop operations with minimum maintenance!

Gives Years of Tough, Repetitive Service

New, longer life operation, new freedom from maintenance is made possible by the heavy-duty Westinghouse Air-Break Contactor. Because it operates in air instead of oil, the new Type AH Contactor increases contact life . . . reduces maintenance to routine checkups. Rating: 5000 volts maximum.

Limits Fault Currents in .002 seconds

Fast-acting Type BAL Fuses protect the circuit against faults beyond the interrupting capacity of the contactor . . . limit fault currents in ⅛ cycle . . . completely clear them in ½ cycle. Interrupting capacity: 150,000 kva at 2300 volts; or 250,000 kva at 4160 volts, 3 phase, 60 cycles.

Installs Fast and Easy

One all-welded steel cabinet houses the starter and circuit protective components. On-the-job wiring is limited to making connection to line and motor. Standardized cabinets make attractive single or group installations and simplify future addition of control units.

Get the complete facts. Contact your nearby Westinghouse representative today or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-60661

Send for bulletin B4023

Westinghouse Combination Starter with the Air-Break Contactor

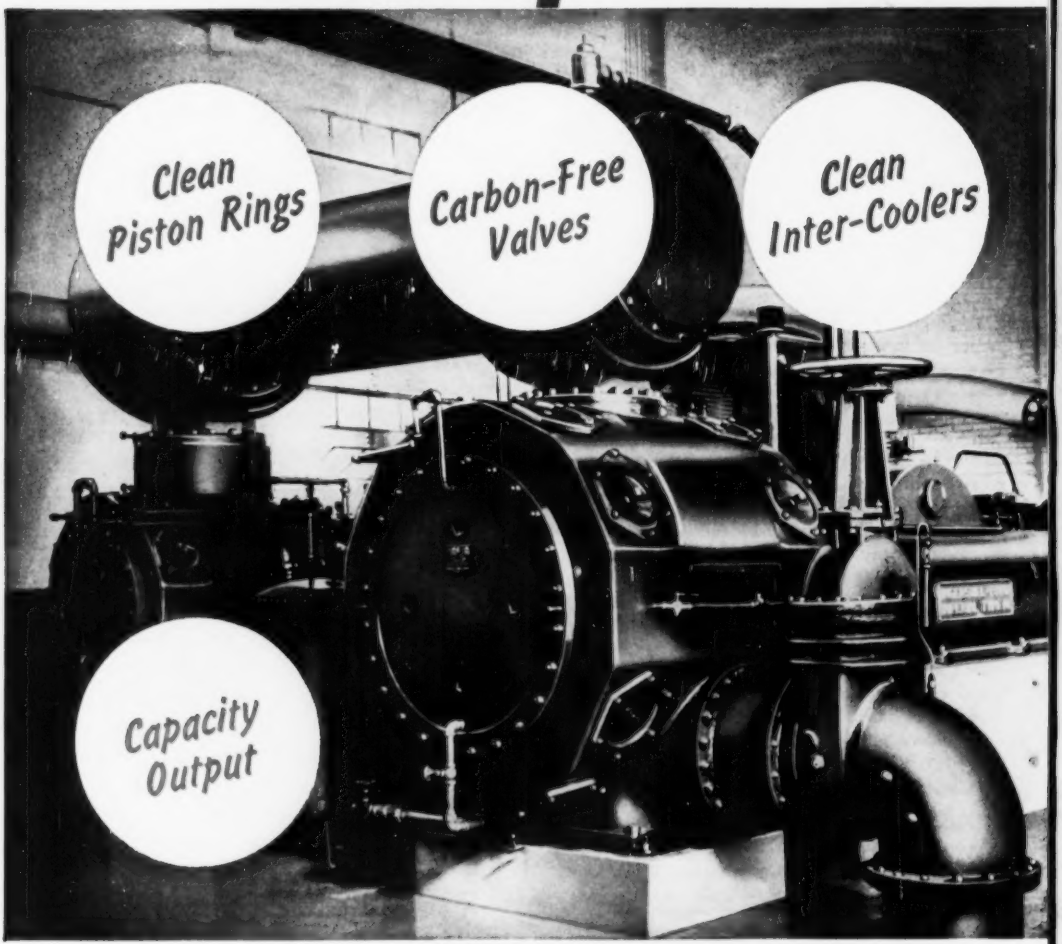
- New, longer life, heavy-duty Air-Break Contactor
- Millions of trouble-free operations
- Maintenance minimized . . . contact life extended . . . no oil to check or replace
- Exclusive arc interrupter design eliminates continuous blowout-coil losses

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

Industrial Controls

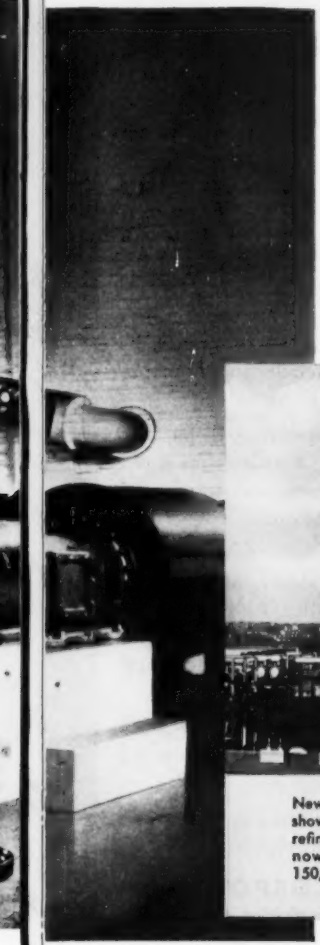
TROUBLE-FREE
Under Any Pressure



SINCLAIR

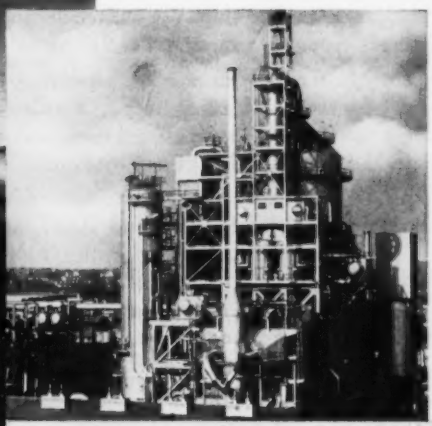
YOUR NEAREST SUPPLIER OF SINCLAIR PRODUCTS WILL GLADLY ARRANGE

Compressor Operation with Sinclair Rubilene



In many industries positive supply of air is a vital necessity . . . which means that reliable compressor performance is imperative.

With Sinclair RUBILENE, an operator can be confident of uninterrupted performance. RUBILENE has the ability to resist oxidation under high temperatures, to reduce carbon and sludging and to keep sustained lubricating quality through long service. It assures full capacity output by keeping valves and rings clean and free. For positive lubrication, better try RUBILENE.



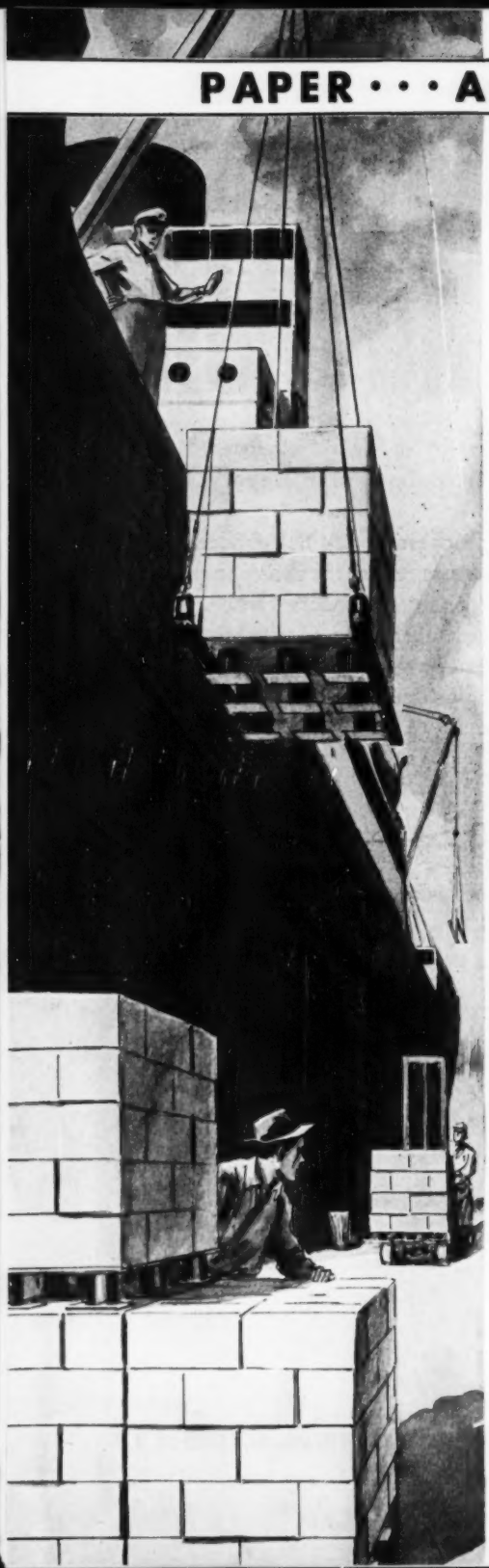
New Fluid Catalytic Cracking Stills (like the one shown here) are helping to expand Sinclair's refinery output. Sinclair's great refineries are now turning out products at the rate of 150,000,000 gallons of lubricating oil yearly.

About 40% of all the Aircraft Engine Oil used by domestic Airlines in the U.S.A. is supplied by SINCLAIR. The same careful research that developed this high quality oil for the Airlines is put into RUBILENE and other Sinclair Oils.

INDUSTRIAL OILS

FOR LUBRICATION COUNSEL, OR YOU MAY WRITE TO SINCLAIR REFINING COMPANY, 630 FIFTH AVE., NEW YORK 20, N. Y.

PAPER · · · America's 6th Industry



PAPER PALLETS CUT SHIPPING COSTS

(NEWS ITEM: *Disposable 8-lb. paper pallets are replacing 60-lb. wooden skids for economical shipment of large unit loads.*)

A new method of reducing freight costs is the use of water-resistant paper pallets that can be discarded at the end of a trip. Made of a corrugated paperboard platform supported by spiral chipboard tubes, these paper pallets can carry static loads of 18,000 pounds in transit by plane, truck, rail or ship. We will gladly supply manufacturer's name on request.

Paper sacks for open storage . . . paper bags to package ice . . . paper for polishing silver . . . new uses for paper calling for new standards of lightness and toughness, new standards of quality in performance.

To meet these new responsibilities and new opportunities developed by the Pulp and Paper Industry, the Puseyjones Organization is now devoting itself completely to the design and construction of Paper-Making Machinery built to new high standards of speed and efficiency, and to the modernization of existing machines.

Additional capacity in Metals Fabrication is now available through conversion of facilities formerly devoted to the building of ships.

Puseyjones Engineers will welcome the opportunity to work with you in solving production problems.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U.S.A.

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1949 Fall Meeting
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Paper TRADE JOURNAL

News of the Week

MILLS

Scott Busy, Expanding Facilities

CHESTER, Pa.—Scott Paper Co. and its subsidiary, Marionette Paper Company, are operating at capacity, with all paper machines running on a seven-day week schedule, according to a company spokesman. The company also reported on the progress of its expansion program:

"The addition of the Cut-Rite division plant at Sandusky, Ohio, now nearing completion, is scheduled to go into production on July 5. The production capacity of the company's Hoboken, N. J., plant is being increased by the installation of additional equipment which is expected to go into operation on or about July 18, and new cooling equipment is to be installed at this plant to meet added process requirements and to improve the efficiency and quality of wax paper production during the summer months.

"As previously disclosed, one of the paper machines at the Marionette Paper Co.'s Fort Edward, N. Y. plant is being rebuilt to increase its capacity by approximately 50 percent on a schedule which calls for completion during July of this year with the loss of only a month's operation. Another high-speed paper machine to be installed at this plant is scheduled for completion at the end of 1949.

"A more recent development is the program for rebuilding, by the latter part of July 1949, one of the company's paper machines located at Milford, N. J., to increase its capacity by approximately 25 percent.

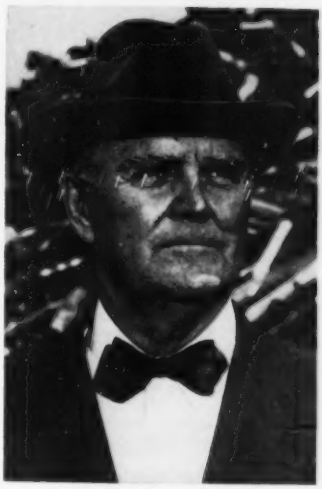
Tissue Ass'n. Holds Open Meeting

ALEXANDRIA BAY, N.Y. — Meeting here as guests of the board of directors of the Tissue Ass'n., at their Spring meeting, June 22-25, some 50 pulp and paper leaders from the East and midwest joined in a round-table discussion of the industry and economic factors. Because of wide interest in the shape of the economic picture, H. G. Wintgens, president of the Association and vice-president of Hoberg Paper Mills, Inc., had suggested that the session be opened to the entire industry.

Millers Falls Financing

MILLERS FALLS, Mass.—The Millers Falls Paper Co. has borrowed $125,000 from the New England Mutual Life Insurance Co. of Boston, it was disclosed on June 13. The decision by the board to borrow this money followed approval of the stockholders on February 18, the loan being secured by mortgages on the real estate and personal property of the company. Under the mortgage papers filed, the promissory note of the company is secured by real estate and chattel mortgages on the concern's property and equipment. In addition to the three parcels of company land north of the Millers River in Erving, two other properties in Montague are included, plus all other real estate of the company in the two towns, including "all dams, dam sites, abutments, gates, spillways, aprons and flashboards." In addition, all "riparian water power and other rights in and to the Millers River and rights of flowage" are included.

Among the 11 specific conditions laid down in the mortgage agreement, the company agrees that "it will not declare or pay any dividends, or apply any money or property to the retirement of any of the shares of its capital stock except out of net earnings subsequent to January 1, 1949."



70TH ANNIVERSAY

Reuben B. Robertson, president of Champion Paper & Fibre Co., Canton, N. C., celebrated his 70th birthday anniversary on June 11 at his home at Flat Rock with a simple family dinner. . . Mr. Robertson, a native of Ohio, joined the Champion Fibre Co. in 1907 and in 1912 became general manager of the company's Canton plant. He became president of the company and held the position until 1935 when it merged with the Champion Paper & Fibre Co. and he was named executive vice-president. Mr. Robertson succeeded Logan C. Thomson as president following the latter's death in 1946. . . In 1932 Mr. Robertson was awarded the honorary degree of doctor of science by State College, Raleigh, for his "achievements in science, in industry, and in promoting social welfare." He has been active in the civic and business life of Asheville and North Caroline for more than a quarter of a century.

Doane-Goodfellow Nuptials

NEW YORK—Miss Mary Goodfellow of New York and Montreal, daughter of George C. Goodfellow of Montreal and the late Mrs. Goodfellow, and Richard C. Doane of New York and Montclair, N. J., were married on June 17 at Christ Church, Park avenue at 60th street. A small reception followed in the Gold Room of the Plaza hotel. The attendants were Mrs. R. Dexter Brown of Boston and James W. Sanders of Montclair.

The bride is a graduate of King's Hall, Compton, Quebec, and attended Mlle. de Montauzon's School in Paris. She also studied art and music abroad. The former Miss Mary Goodfellow is the well-known designer of hats.

Mr. Doane, a graduate of Yale University, is vice-president of the International Paper Co. and until recently was general manager of the Canadian International Paper Co., Montreal.

Following a brief wedding trip, the couple will reside at 444 East 52nd street.

Southern Felt Corp. Buys Madix Firm

MOREHEAD CITY, N.C. — Southern Felt Corp., on June 14 bought the Madix Roofing Co. In a letter to *Paper Trade Journal* dated June 18, Otto A. Sandusky stated: "Both plants are shut down at this writing and the stockholders of the Southern Felt Corp., informed me that they might be forced to go into the manufacture of asphalt roofing provided they failed to sell both plants. Kinan W. Rand succeeded Willis H. Aldridge as president of the Southern Felt Corp., and I am still the superintendent and technical director."

Quebec Co. Valuation Indefinite

OTTAWA — Though the Province of Quebec has indicated that the properties of the Quebec Pulp & Paper Co. would be taken over for one and one-half million dollars for the company in liquidation, there is no authoritative report regarding valuation of the company's preferred shares.

Olmsted, Jr., Named NELI Director

BOSTON—George Olmsted, Jr., president of the S. D. Warren Co., has been elected a director of the New England Life Insurance Co.

SORG FIRST IN FIRST-AID COMPETITION

Sorg Pulp Co., Ltd., Port Mellon, B.C. took first place in the recent Second Annual Howe Sound First-Aid Competitions held at Brittania Beach, B.C. . . "This achievement was considered unusual", says Leander Manley, secretary-manager of the Western branch of the Canadian Pulp & Paper Ass'n., "because the Sorg team was competing with two teams of the Brittania Mining Corp., Ltd., and the team of the British Columbia Pulp & Paper Co., Ltd. . . This latter team won, in March of this year, the 1949 First Aid Trophy for the best First Aid Team in the pulp and paper industry in British Columbia. Therefore the Sorg team was up against top-flight competition." Pictured above (left to right) are: E. C. Corson presenting the trophy to E. Kinne (captain), F. Watkins, W. Arrowsmith, R. Jarrett, T. Turner and J. E. Cowan of the Sorg team.

Tour Olympic Peninsula Forests, Mills

SEATTLE, Wash. — A forest-study group of some 30 men, sponsored by the forestry committee of the Seattle Chamber of Commerce, returned June 15 from a three-day tour of the Olympic Peninsula's National Forest and forest-industry plants. A report based on information accumulated during the inspection will be submitted to congressional committees for use in studying the proposed removal of a portion of the Olympic National Park for logging on a sustained-yield basis.

The touring group included forestry engineers and economists. It was accompanied by H. L. Plumb, supervisor of Snoqualmie National Forest and Preston Macy, superintendent of Olympic National Park. They visited the Crown Zellerbach paper mill at Port Angeles, logging operations of Rayonier, Inc., near Lake Pleasant, and fibreboard and plywood plants on Grays Harbor and at Shelton. Chairman of the tour was Clarence Malmo, Seattle logging operator.

Congressional committees are expected to appear in the Pacific Northwest or hold hearings in Washington, D.C., on proposed legislation to free certain timber areas now within the national park. The move to cut down the park's size has the active support of the timber industry and Olympic Peninsula communities.

Kieffer Rebuilding Nearly Complete

EWING, Ind. — Rebuilding of the Kieffer Paper Mills is nearing completion. The mill building is all new construction of steel, brick, and concrete, monitor type, approximately 340 feet long by 165 feet wide and contains 3500 square feet of ribbed glass windows. The entire interior has been painted white and the building is just about as light inside as outside. All electrical wiring is in conduit, as well as all power wiring.

The company will manufacture its own current with a larger generator than it had before the fire, and large enough for 20 percent increase in production.

The mill contains three paper machines: one 40" trim, one 56" trim and one 64" trim, all single-cylinder machines and their products are all specialty papers. Installing of No. 3 machine is completed and a satisfactory trial run was made June 13. No. 2 machine is expected to be in operation in 60 days and No. 1 machine in about 90 days.

Samples of the mill's products will soon be sent to customers. The company manufactures Shoksorb Moulded Indented, a nationally known packing paper, IXL crepe papers, papier mache board and other specialty papers. Also light weight interior packing paper, sold exclusively to Shoksorb Paper Products Co., a subsidiary company which fabricates it into multiple ply pads for packing furniture and other purposes.

The rebuilding was under the supervision of J. E. Kieffer, treasurer of the organization, who has managed the plant since the company was formed in 1905. The work of rebuilding the paper machines, electrical work and laying the concrete floors, piping, painting, etc., was done by Kieffer employes.

Miss Edna S. Robertson is general manager, Thomas P. Kieffer, assistant manager, and Elmer F. Darlage, mill superintendent.

New St. Regis Polyethylene Process

NEW YORK—The Research and Development Department of the St. Regis Paper Co., working in conjunction with technicians of the DuPont Company, has developed a process for coating kraft papers with synthetic resins, most notably polyethylene, which promises to open new and important markets for the use of the multiwall bag.

With its new coating operation in production, St. Regis reports that it is in a position to provide, on an economic basis, a multiwall bag containing a sheet of kraft paper coated with polyethylene for many heretofore unpackable or hard to pack materials.

The characteristics of the polyethylene multiwall bag, it is pointed out, make it a superior container for the packaging of hygroscopic materials, particularly in the chemical and food fields, and notably for the protection of original fresh-packed quality in the food field.

Multiwall bags containing polyethylene coatings have been in commercial use for over a year and the success attained has indicated, the company reports, that the improved moisture and grease-proof protection provided by bag walls coated with this synthetic resin marks an outstanding advance in the technology of multiwall bag construction.

St. Regis researchers point out that polyethylene to a substantial degree is unaffected by acids and alkalis, provides an excellent grease and oil barrier and is odorless and tasteless and also strengthens the sheet to which it is applied.

The efficiency of the polyethylene coated bag has been tested and approved under actual conditions in a number of plants of customers of St. Regis. These tests included the packing of meat trimmings, calcium chloride, powdered skim milk and synthetic resins.

Slated for Treasurership

HOLYOKE, Mass. — Reports were afloat in paper manufacturing circles on June 8 that Attorney Charles L. Kirkpatrick would become treasurer of the American Writing Paper Corp., succeeding the late William J. Norton, who held that position with the concern for many years.

Mr. Kirkpatrick has been with the company since before the war, having served for several years as secretary of the company, and executive secretary to Vice-president Peter Freedman. He was legal adviser to the paper manufacturers' committee, representing the firms holding indentured rights along the local canal system, when they concerned themselves with the recent controversy over power rights between the privately-owned Holyoke Water Power Co. and the Municipal Gas and Electric Department.

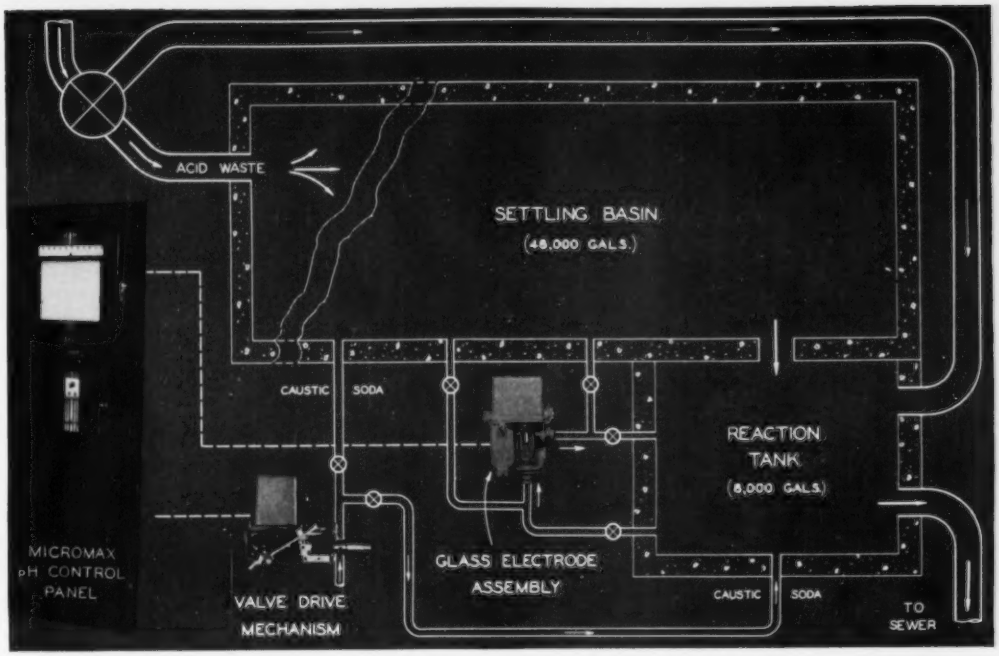
Assisting Mr. Kirkpatrick, it was reported, will be George A. Tyler, a veteran assistant in the treasurer's department of American Writing Paper.

Central Paper Co. Employes' Vacation

MUSKEGON, Mich. — Central Paper Co., will close down for its employes' annual vacation, July 4-9. The general and sales offices will remain open, but all other departments, including shipping and receiving, will be closed.

CPA to Golf at Medinah

CHICAGO—The Chicago Paper Ass'n., under the leadership of Joe Druth as tournament chairman, will hold its annual golf tournament at the Medinah Country Club on September 1.



Schematic plan diagram of Micromax Automatic pH Control as applied to acid waste in Western Electric Co.'s new "controlled conditions" plant at Allentown, Pa. Waste is from metal-finishing and -plating operations.

Industrial Wastes Neutralized Dependably With Help of Micromax pH Control

Western Electric Co.'s new Allentown, Pa., plant includes not only an adequate waste-neutralizing system, but has that system so arranged that waste is accurately brought to a specific pH value before going to the outfall in the Lehigh River. Neutralization is carried out effectively by the well-known Micromax pH Control System, used for years in a wide variety of industrial applications. Highly sensitive and responsive, this rugged equipment provides dependable "round the clock" service, day after day.

Anyone with a waste neutralization problem is invited to make use of our unique service for determining its control possibilities. We call this service "controllability analysis." The culmination of many years of study and experience, this analysis actually predetermines, in detail, the conditions necessary for successful pH control in the individual plant. If the plant has a waste-treating layout already in use, analysis will predict within what limits pH can be held. And, if these limits are not satisfactory, we can usually suggest practical changes which will bring about the desired results. The analysis is quickly made, requires very little of your time, and can be done from information you supply us by mail. If you would like to see what "controllability analysis" will mean to you, just send for Bulletin or write to Leeds & Northrup Co., 4967 Stenton Ave., Phila. 44, Pa.

*Remember—
. . . Bulletin ND44-96-708

Send for your copy today!

This convenient publication, containing a number of pictures and illustrations, explains in simple, understandable language the many benefits of Micromax pH Control in "Effective Neutralization of Industrial Wastes."

MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

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Jrl. Ad ND44-96-708(1)

York, Pa., Sheriff's Sale

YORK, Pa. — Property of the York Paper Mfg. Co., Inc., and Joseph DiCandia, its mortgagor, will be sold at a sheriff's sale at 10 a.m. July 2 in the Court House annex in accordance with an order from the Common Pleas court.

The property consists of slightly more than 18 acres of land in Springettsbury and Spring Garden townships, a one-story brick paper manufacturing plant with a machine room, boiler room and other equipment, a three-story brick grist mill and a one-story brick office building, all on a railroad siding. It is located on Mill creek just north of the 1700-block East Market street.

All buildings are equipped with machinery and utensils used to carry on the paper business. A complete list of the personal property is on file at the sheriff's office.

Mr. DiCandia, a New York waste paper plant owner, bought the plant in August 1947 for $300,000. He had paid $23,000 down and mortgaged the rest at 2½ percent interest.

Train 100 4-H Georgians

WAYCROSS, Ga.—More than 100 4-H Club boys from 57 south and southeast Georgia counties took part in this year's one-week training course in forestry, J. J. Armstrong, general manager of the Woodlands Division of the Union Bag & Paper Corp., reports. The project is jointly sponsored by Union Bag and the Georgia Agricultural Extension Service and was inaugurated five years ago.

With a number of county agents and instructors, the boys visited the Union Bag plant at Savannah. Following a tour of the operation the visitors were guests of the company at a luncheon on the picnic grounds of the Mary Calder Golf Club.

Instructors furnished by the Commission and the Extension Service included, among others, conservation foresters from Union Bag & Paper Corp.

Retiring Westvaco Veteran Feted

MECHANICVILLE, N. Y. — James E. Prout, who was pensioned during the week of June 12 after 50 years of service with the West Virginia Pulp & Paper Co., was the guest of honor at a dinner tendered him by members of the Community Club at the Mansion House near this village. Mr. Prout concurrently celebrated his 25th year as a member of the Foresters of America.

Westvaco on the same date retired 20 other employes under its pension plan installed a year ago.

Canadian Wallpaper Mfg. Co.

TORONTO—Decrease in net working capital is shown in the balance sheet of Canadian Wallpaper Mfg. Co., and subsidiaries as of April 30 last, the total standing at $1,433,412, against $1,749,804 a year ago. Current assets appear at $2,134,201 and current liabilities at $700,789. Inventories are shown appreciably lower at $1,149,018, against $1,231,009. Operating profit appears at $90,592, or 71 cents a share, compared with $245,687, or $1.91 a share in the previous year. Operating profits totalled $276,586, against $602,944. The company has consolidated the operations of the company and its three principal subsidiaries, R. N. Boxer Co.; Stauntons, Ltd.; and Watson Foster Co.

Longview Building Oakland Plant

OAKLAND, Calif. — The Longview Fiber Co. on June 11 reported it had begun construction of a corrugated shipping container manufacturing plant here on a six-acre site at 85th and San Leandro streets. A building with 120,000 square feet capacity will be erected and will be ready for use near the end of the year. Investment with equipment will be more than $500,000.

Material Arriving at Nachez Mill Site

NACHEZ, Miss.—June 6 was "delivery day" at the International Paper Co., plant, when the first train of supplies for the huge new plant backed across the new bridge thrown across St. Catherine Creek to the building site. The rail spur connects with the Nachez & Southern, Missouri-Pacific and Illinois Central railroads. I. P. engineers built the bridge.

Paper Mill Urged for Bihar

WASHINGTON — A paper mill is included in the industrial development projects which have been recommended by the provincial government of Bihar, India, as part of a five-year program which would total $181,000,000 in U.S. equivalent funds. Private investors in India are expected to make the bulk of the contribution toward realization of this development.

Gordon Johnston Field Mill Site?

TALLAHASSEE, Fla.—The New York & Pennsylvania Co., and the Coosa River Newsprint Co., have completed surveys on the possibilities of establishing plants at Gordon Johnston Field and are rumored to be pleased with their findings. The Coosa River company was aided in its survey by the Tallahassee and Carrabelle Chamber of Commerce.

Leon Simkins, V-P Sales

MIAMI SPRINGS, Fla. — The Miami Paper Board Mills, Inc., has named Leon J. Simkins vice-president in charge of sales. Mr. Simkins is the son of Samuel Simkins, president of Miami Paper Board Mills, Inc., National Box Corp., National Paper Box Mfg. Co., Simkins Paper Box Mfg. Co., and Piedmont Carton Co.

West Carthage Mill Resumes

CARTHAGE, N.Y.—The West Carthage Mill of the St. Regis Paper Co., reopened on June 21, after having been shut down since May 7. The paper mill will be run four days a week. For the present it will manufacture cement bag paper which will then be shipped to other St. Regis mills to be made into bags.

Eaton's Clayson Drive Planner

PITTSFIELD, Mass.—George P. Clayson, Jr., vice-president of the Eaton Paper Corp., on June 8 was named to a three-man planning committee to make arrangements for the 1949 Community Chest drive. A veteran Community Chest worker, Mr. Clayson has taken part in eight campaigns, and formerly was county chairman of the Red Cross drive.

Bridgham Honored for 4-H Aid

WEST SPRINGFIELD, Mass.—F. Nelson Bridgham, vice-president and treasurer of the Strathmore Paper Co., and president of the Horace A. Moses Foundation, on June 16 received a silver medallion at Washington for his outstanding service to the 4-H Club movement.

CONVERTERS . . . .

Bids in Cellutin Equipment

HOLYOKE, Mass. — Miscellaneous equipment of the Cellutin Corp., 380 Dwight street, including motors, was bid in on June 8 by Attorney Frank E. Button at a public auction conducted at the former Cellutin plant.

Mr. Button was acting for Thomas R. Weymouth of New York, trustee for stockholders of the Weycraft Paper Corp., which held a chattel mortgage on the equipment being auctioned. His bid was $3,000, and there were no other offers from the group of ten attending. Deputy Sheriff Matthew J. Curran was auctioneer.

Only the equipment on which Weycraft held a mortgage was auctioned off. This will be offered for resale at a later date.

The Cellutin Corp., a paper-finishing firm, ceased operations here some months ago.

Doherty, Mill Agent, Seeks Lines

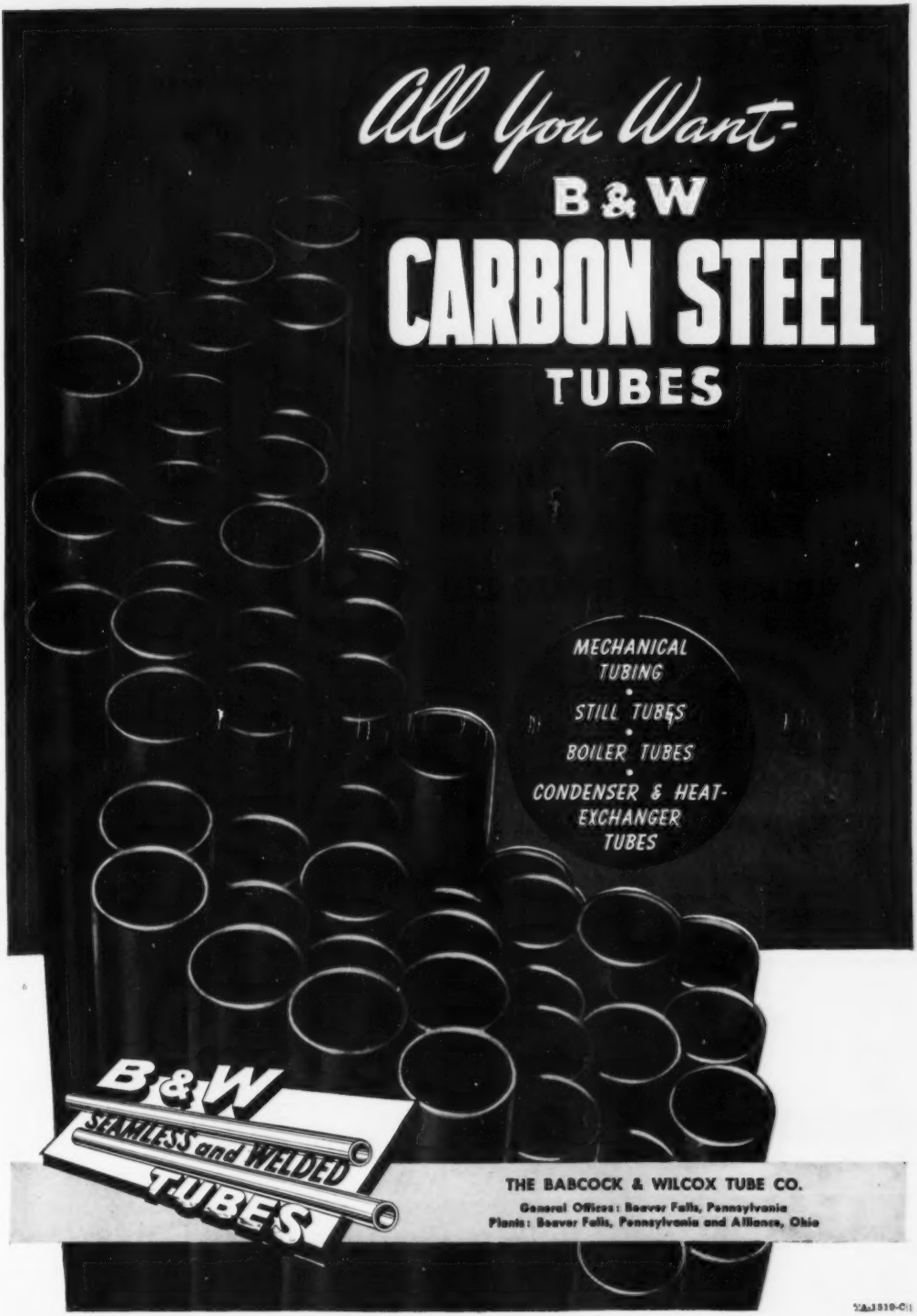
DETROIT—F. R. (Red) Doherty, 803 Kales building, is now operating as a mill agent representing the Wayne Paper Box & Printing Corp., and the Rutledge Paper Products Co. He is looking for additional non-conflicting lines to represent.

Cumberland Plant to Begin, July 1

CUMBERLAND, Md.—The Allegany Paper Box Co., Howard and South Mechanic streets, is expected to begin operations about July 1. T. E. Straw, former manager of the Martinsburg Paper Box Co., heads the new enterprise.

Epstein Launching Proven Co.

BOSTON—Proven Paper Mfg. Co., a new concern, of which Harry T. Epstein, who now conducts the Paper Products Co., 80 Federal street, will


All You Want-
B & W
CARBON STEEL
TUBES
MECHANICAL TUBING
STILL TUBES
BOILER TUBES
CONDENSER & HEAT-EXCHANGER TUBES
B&W
SEAMLESS and WELDED
TUBES
THE BABCOCK & WILCOX TUBE CO.
General Offices: Beaver Falls, Pennsylvania
Plants: Beaver Falls, Pennsylvania and Alliance, Ohio

be manager, is expected to be in operation within the next 30 days at Lewis Wharf, corner of Atlantic avenue. The company, which will occupy three floors with approximately 12,000 square feet of space, will manufacture a number of paper products, the nature of which will be definitely announced when in full operation, to be sold entirely through paper jobbers. A number of the items to be manufactured are covered by U.S. patents. The Paper Products Co. will remove from the present address on or about July 1 and will have an office and warehouse at the same Lewis Wharf location.

Noon Bag Co. Purchased

PORTLAND, Ore. — Sale of the Noon Bag Co., regarded as probably Oregon's oldest continuously-operated business, and plans for its extensive modernization and improvement were disclosed on June 10.

The purchasers are a group headed by William Einzig, president and manager of the Great Western Malting Co. of Vancouver, Wash.; William Tannenbaum, ex-owner for many years of the Southern California Bag Co., Los Angeles; H. E. (Mike) Sanford, Portland, vice-president of the Continental Grain Co., and chairman of the National Grain Trade Council; and several others interested in kindred businesses.

The operation was acquired from the estate of the late Mrs. Kathlene Armstrong. Approximately $500,000 was involved in the transaction, Mr. Einzig said.

Included in the purchase was the equipment and business of manufacturing bag containers of all types, but not the building at 34 N.W. First avenue, he added. The purchasers expect to continue the business as in the past and the entire staff is being retained. Douglas Cruikshank will continue as sales manager. Miss K. M. Moore, formerly manager, is retiring, however, he said.

The firm was established in 1853 and reincorporated in 1893. It has operated continuously at the present site for more than 60 years.

Sheppard Envelope Employes' Outing

WORCESTER, Mass. — More than 100 persons attended the annual outing of the Sheppard Envelope Co. employes on June 4 at Twin Oaks Lodge in Sterling. Miss N. Myra Glazier, president of the company, was hostess at the affair.

MERCHANTS

Wayman Succeeds Wheelwright

BOSTON—Warren Wheelwright, formerly of the Boston office of Wheelwright Papers, Inc., representative of the Mead Corp., has become associated with the Colonial Paper Co. as salesman, covering Greater Boston. James Wayman succeeds Mr. Wheelwright at Wheelwright Papers, Inc.

Wholesale Firm Incorporated

HIGH POINT, N.C.—The General Paper Co., has been incorporated as a wholesale paper business by F. D. Kearns, R. W. Fuller, Jr., and J. M. White, with authorized capital stock of $100,000.

Hopper, School Board Member

TAYLORVILLE, Ill. — B. C. Hopper, president of the Hopper Paper Co., has been appointed a member of the Taylorville unit board of education.

Trimble Los Angeles CMA V-P

LOS ANGELES—Elmo Trimble of the Wilson Paper Co., has been elected second vice-president of the Los Angeles Credit Managers Ass'n.

O'Mell Memphis P.A.'s V-P

MEMPHIS—Sol O'Mell of the Mayer-Myers Paper Co., has been named vice-president of the Memphis Ass'n. of Purchasing Agents.

Wilder Bros. Co. Moving

PHILADELPHIA — Wilder Bros. Co., now at 12th and Brown streets, will move soon to new quarters at 16th street and Indiana avenue.

FORESTRY

Expand South's Forests, NPA Urges

WASHINGTON—A greatly expanded program for conservation and development of Southern states' forest resources was recommended to the President's Council of Economic Advisors by the National Planning Ass'n., as part of a long-range undertaking for broadening the economy of that area. This is among projects "which could and should be undertaken now," the report, released on June 20, stated.

Among recommendations in this connection, the report suggested: (1) Increase of the Forest Service budget "substantially" above the present $60,000,000 allotment; (2) An increased educational campaign to impress the public with the importance of forest development; (3) Long-term credits at low interest rates to encourage proper management of forest lands.

Pointing out that the States have an important role in the field of taxation, the Commission said "Forest lands should be classified and taxed at a low rate during the growing period; a substantial severance tax could then be levied when the timber is cut."

The report found that the Southern states have done very little in this field as yet, and suggested that "if the Federal government advanced loans for forest development at law rates of interest, it might well require that the states do their share by reorganizing their systems of taxation.

The Southern States have 50 percent more forest land proportionately, than the rest of the nation with 42.7 percent of its acreage in commercial and non-commercial forest lands, combined. Forests thus constitute one of the South's most important natural resources, it is pointed out.

The report estimated pulpwood consumption in the south at 7,153,000 cords in 1945, including consumption in Maryland and West Virginia.

'A program is essential for increasing the growth output of Southern forests to meet the needs of an expanding pulp and paper industry in addition to the needs for lumber," said the report.

"The role of the Federal government in this field has been well-developed, and is susceptible of effective expansion."

Salvaging Looper-Hit Logs

VANCOUVER, B.C.—Bloedel, Stewart & Welch, Ltd., are still waging their battle against time at Sarita River on the Alberni Canal, 26 miles below Port Alberni, B.C. Here 350 loggers are fighting to salvage 300 to 400 million feet of timber infected by looper caterpillars. The job must be completed within a maximum of five years and is claimed to be the largest log salvage operation ever attempted in Canada, if not on this continent.

The timber, 11,900 acres of it, was killed during the hemlock looper infestation of 1945-46. Sixty percent of all timber being logged is looper-killed. The salvaged logs are being used at the Port Alberni mills of Bloedel, Stewart & Welch, Ltd.

Salvage operations were started in 1948 by Bloedel, Stewart & Welch, Ltd., with R. S. "Bob" Banks logging superintendent in charge. As there are no railroads or large steamship transportation services to the area, all material, including huge crawler-type tractors, logging trucks, road building equipment and lumber had to be brought in from Port Alberni by barge.

Mr. Banks bulldozed the top off a nearby hill and on the site he built bunkhouses, cookhouse, offices and other headquarters buildings. On a flat south of the main camp he established the married quarters where 20 families are now in residence. Along the beach he put the main road, machine shops and log dumps.

Before the operation "Salvage" is completed, 60 miles of road will be built at a cost of $18,000 per mile. The road required ballast three feet deep because of the weight placed upon the great Sterling trucks used in the logging. Gross load of truck, trailer and logs will be about 80,000 pounds, or 40 tons. The trucks can carry 25,000 fbm of logs per trip, and as many as 32 loads are coming out of the woods daily. Seventy-five million feet will have been taken out by this year's end.

The whole operation is kept in high gear due to the five-year deadline. Foresters believe that the hemlock will be useful for lumber for four years, and can still be used for pulp for another year. By the end of the five-year period, cubical rot will have damaged

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Low Head Wheel Carriage, Patented Automatic Infeed Mechanism and Automatic Crowning Device assure greater accuracy and higher degree of finish on the face of your rolls. Low Head Wheel Carriage reduces vibration, permits faster, easier handling of rolls. Write for details.

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EXPORT DEPARTMENT

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the wood to the extent where it is no longer valuable.

Bloedel, Stewart & Welch, Ltd., have depleted their Franklin River operation of men and equipment in an all-out effort to save as much of the hemlock as possible before it spoils. They will be forced to practically rebuild the transportation system at Franklin River when they return there, which is adding greatly to the cost of salvaging.

The infected areas extend from the Sarita River over the summit to the Klanawa, which is the main drainage system between the Nitnat and the Alberni Canal. The loopers appeared to follow the water courses, and were found at elevations varying from a few feet above sea level to 1,000 feet. The infestation started in 1945, when foresters noticed the damage being done by the little inch-long looper caterpillars. A report was made at that time, but a study of the situation, and failure to locate any manifestation of a previous infestation, convinced the scientists that the condition was local and would burn itself out.

By the mid-summer of 1946, however, it was evident that the loopers were reaching epidemic proportions, and steps were taken by the British Columbia Forest Service and the Dominion Department of Agriculture, forest insect division, to spray infected areas with DDT and fuel oil.

About that time, some of the entomologists noticed that the loopers seemed to be weakening, and they also found quantities of dead ones. Because of this new development, which came about July 1, it was agreed that the spraying should be delayed a few days.

By July 15, there wasn't a looper left alive in the whole area.

The entomologists were hard-pressed to find enough healthy caterpillars to continue their experiments. The virus that killed them was later identified as Wilt Disease.

Officials of the company stressed the fact that the salvage was not a profitable operation in itself. Part of the cost is being charged to forest fire prevention, inasmuch as dead trees, if left on the area would constitute a dangerous fire hazard. The roads being built now wil serve again when the remaining timber is ready for logging, when it reaches maturity.

Another factor adding to the cost of logging is the high percentage of breakage in the dead timber. The dead trees are defoliated, and with no green tops to retard the rate of fall, come to earth with terrific force and hit the ground harder than green trees.

The salvage of this timber will be watched with interest by the logging industry, by the public and by scientists, for it concerns them all vitally.

Gifford Pinchot National Forest

WASHINGTON — The President on June 15 signed a proclamation changing the name of the Columbia National Forest in the State of Washington to the Gifford Pinchot National Forest in honor of the first Chief of the U. S. Forest Service who died October 4, 1946.

STOP FOREST FIRES

E. B. Livingston (left) of the Mississippi Forestry Commission, holds the stencil which Bill May, (right) Illinois Central Railroad forester has just employed to paint "Stop Forest Fires" on one of the railroad's 1,200 pulpwood cars, all of which are similarly marked. . . The slogan was originated by the Mississippi Forestry Commission for use in that State . . . The stenciling project was sponsored by R. E. Barr, vice-president in charge of traffic of the I.C., and P. R. Farlow, the road's general agricultural agent.

LETTERS

Dear Sir:

I receaved the Paper Trade Journal with many thanks. It is the first times since the outbreak of the Postwar.

On the Paper Trade Journal March 24, Vol. 128, No. 12, 1949, Page 59, "Letters," Mr. A. S. Cosler wrote the paper industry in Japan.

This letter was written in March 14, and he died next day on March 15.

He was Head, Paper and Pulp Group, G.H.Q., SCAP, ESS, and was most earnest for the Reconstruction of Japan paper industry.

Herewith I report his last letter, and his obituary with sorry.

HISASHI NAKAMURA
Managing Director
Hokuetsu Paper and Pulp Mills Co., Ltd.
Tokyo, Japan

LABOR

Bridgewater Workers Must Vote Again

ADAMS, Mass. — Stephen D'Arcy, NRLB representative, on June 9 ordered that employes of the Brightwater Paper Co. must vote again for a bargaining agency to represent them in dealings with the company.

Mr. D'Arcy's ruling that a runoff election will be necessary came after he had determined that none of the unions involved obtained a majority of the votes cast at the plant in NLRB-supervised elections on June 7.

The original election was held on petition of the IBPM, AFL. Also listed on the ballot was the TWUA, CIO, which was an intervener when the paper makers union sought certification. A vote for neither union was ruled to have been in favor of Local 12,798, UMW, already the official bargaining agent at the plant.

In the balloting, a total of 159 votes were cast out of 168 listed as eligible to participate in the election. Of these, 75 were marked "neither," the ballot designation for the UMW. The TWUA received 73 ballots and the paper makers union obtained only six votes. There were five challenged ballots.

In the runoff, to be held within two to eight weeks, the only question on the ballot will be whether workers want to be represented by the TWUA, with a no vote being recorded for the UMW.

No Time Lost in April

OTTAWA—According to the Department of Labor, Canadian Government, no time was lost in labor disputes in the pulp and paper products industry, nor in the logging industry, during April.

SUPPLIERS

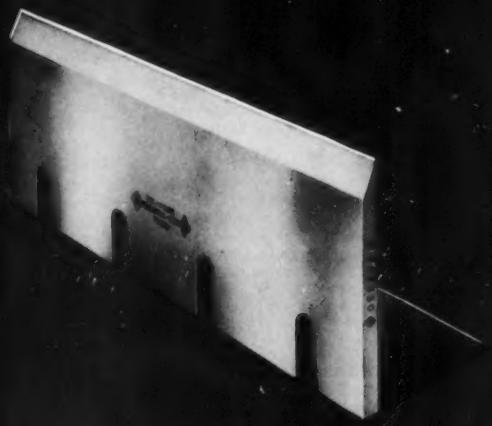
Roland A. Packard on June 15 was elected executive vice-president and general manager, and a director, of the Holyoke Machine Co., Holyoke, Mass. Mr. Packard's appointment was reported by Julian L. Sagalyn, who is retiring as treasurer to succeed his late father, Raphael Sagalyn, as president of the Industrial Buildings Corp., of Chicopee. The elder Mr. Sagalyn was also president of Holyoke Machine, and is being succeeded in that capacity by Attorney Nathaniel M. Harvey. Irwin Sagalyn, who has been vice-president, succeeds his brother, Julian, as treasurer. Roger J. Chamberlain has been reelected assistant treasurer.

National Distillers Chemical Corp., Ashtabula, Ohio, wholly owned subsidiary of National Distillers Products Corp., under a long-term contract with Hooker-Detrex, Inc., will supply the latter corporation with substantially all of the chlorine production of the $10,000,000 sodium and chlorine plant which National is building in Ashtabula. The chlorine will be delivered to Hooker-Detrex in the form of gas via pipe line. Both projects are scheduled to be in production by April, 1950.

Combustion Engineering–Superheater, Inc., New York, has named H. D. Nickel manager of its new district office serving Washington and Oregon. The office is to be opened on or about July 1 in the Skinner building, Seattle.

Roger W. Batchelder has been appointed vice-president in charge of sales of the National Bearing division of the American Brake Shoe Co. He will continue to be located at division headquarters in St. Louis.

First choice for chips



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60th ANNIVERSARY
1889 1949

HEPPENSTALL COMPANY
PITTSBURGH 1, PA.

A new centrifugal pump test floor, heralded as containing the most efficient and accurate commercial pump test facilities ever developed, has been put into service at the West Allis works of the Allis-Chalmers Mfg. Co., Milwaukee. Though the primary use of the new facilities will be for commercial pump tests, the data taken will be of value in improving pump design, and it is planned that some research work will also be done on the new test floor.

Link Belt Co., Chicago, has moved, or soon will move four of its branch offices to larger quarters. They are: Cleveland—314 Hanna building, Paul V. Wheeler, district manager; Baltimore—2315 St. Paul street, Charles C. Wiley, district manager; Newark, N.J.—212 Essex building, 31 Clinton street, John D. Riley, district manager; and Huntington, W. Va., (about July 1)—1009 Fifth avenue, David W. Stevens in charge.

Harold E. Strang, of Schenectady, N. Y., engineering manager of the affiliated manufacturing companies department of the General Electric Co., has been appointed manager of the G-E apparatus department's meter and instrument divisions at Lynn, Mass. Mr. Strang, whose appointment was effective June 6, succeeded Nicholas M. DuChemin, who recently was named an assistant general manager of the department.

Roy Johnson, who has been a member of the staff of the Dorr Co., New York, since 1936, has been appointed manager of the central industrial division with headquarters in Chicago, effective July 1. This territory was previously handled by H. W. Hitzrot of New York, in addition to his duties as manager of the Eastern industrial division.

Allis-Chalmers Mfg. Co., Milwaukee, has released "The Hidden World", a 26-minute 16mm sound film in color, a feature of which is a series of scenes taken at the Flambeau Paper Co., Park Falls, Minn., and one of the Streamharker in operation at the Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.

George W. Russell, assistant sales manager of the American Cyanamid Co.'s industrial chemicals division, was elected president of the Chemical Market Research Ass'n. on June 9. The association was organized in 1940. Its membership consists of the market research specialists of about 90 chemical companies of the U.S. and Canada.

Frank A. Juckett, president of the Sandy Hill Iron & Brass Works, Hudson Falls, N. Y., on June 16 received an honorary degree of Master of Arts at the 130th commencement exercises at Norwich University, Northfield, Vt. He was awarded the degree in recognition of his outstanding qualities as a humanitarian.

FIVE LUKENWELDERS

Representatives of the Lukens Steel Co., Coatesville, Pa., and its Lukenweld Division at the Chalfonte-Haddon Hall hotel during the American Pulp & Paper Mill Superintendents Ass'n., convention in Atlantic City. . . Left to right: Robert C. Sahlin, Robert Ervin, George L. Snyder, William H. Funk and William C. Simpson.

The Valley Iron Works (Appleton, Wis.) softball team which is entered in the Appleton City Industrial League leads that league as it has the past four seasons. Since the return of Valley Iron Works veterans in 1946 the Valley team has taken the championship for 1946 and 1948 and was second in 1947.

William B. Bell, president of the American Cyanamid Co., on June 13 received the honorary degree of Doctor of Science from the Philadelphia College of Pharmacy and Science.

Ira Rosin, of 3751 Prospect avenue, Cleveland 15, Ohio, has been appointed as sales representative in the Cleveland territory for the Barnstead Still & Sterilizer Co. of Boston.

TRAFFIC

Direct Sailings, Longview-Manila

LONGVIEW, Wash. — Loading of the Freighter Arizona at the Port of Longview over the June 11-12 week-end marked an extension of service for the local Columbia river waterfront terminal.

The former Victory ship loaded 700 long tons of paper products from the Longview Fiber Co. and Pacific Paperboard Co., of Longview and from Grays Harbor, among other items, and departed directly for Manila, P. I., without making other ports. Direct sailing from here is a feature which the port will continue to offer.

RETIRING JULY 9

Darwin S. Wolcott, vice-president of the Lukens Steel Co., Coatesville, Pa., will retire from the company on July 9 after an association with it which began in 1925.

Revenue Freight—Canada

OTTAWA — Revenue freight carried by the Canadian railways included 333,948 tons of newsprint paper during February this year, an increase of 12,376 tons over the same month of last year, and reached a cumulative total of 663,832 tons in the first two months of 1949, a gain of 53,532 tons over the corresponding period of last year, the Canadian Government reports.

Such revenue freight of other paper amounted to 60,969 tons during February, a decrease of 13,357 tons over February of last year, and totaled 124,275 tons in the cumulative period this year, a decrease of 16,897 tons over last year. Revenue freight of paperboard, pulpboard and wallboard amounted to 51,592 tons in February, down 1,851 tons over last year, and totaled 103,511 tons in the first two months of 1949, up 478 tons over last year. The revenue freight of woodpulp amounted to 161,055 tons in February, down 18,814 tons over last year, and reached a total of only 316,209 tons in the first two months, down 30,836 tons as against a year ago.

Canadian Carloadings

OTTAWA—Car loadings on Canada's railways of woodpulp and paper dropped slightly to 3,590 cars in the week ended June 4 compared with 3,653 in preceding week and 4,221 cars in same week a year ago. The Eastern Division accounted for 3,120 cars in week ended June 4 against 3,241 in previous week and 3,677 in same week last year, with the Western Division showing 470 cars, 412 cars and 544 cars in these respective weeks.

In the period from the first week of 1949 until the week ended June 4, the cumulative total of such car loadings declined to 91,137 cars as against 97,484 cars a year ago in the similar period, with the Eastern Division showing 79,647 cars this year compared with 85,182 last year and the Western Division 11,490 cars as against 12,302 cars a year ago in the corresponding period.

ECA AUTHORIZATIONS

European Recovery Program

OTTAWA—Purchases, payable in hard currency, to be madeover the five-year period, 1948-1952, in connection with development plans of countries participating in the European Recovery Program are outlined in a report by the Organization for European Economic Co-operation, according to a statement by Foreign Trade Service, Canadian Government, from Paris,

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WET-STRENGTHEN your paper with Uformites

When paper towels disintegrate into sopping shreds, somebody's due to lose business—probably the papermaker who neglects to wet-strengthen his paper.

Too bad—especially since UFORMITE 475 gives high wet strength plus maximum absorbency at low cost. As little as $4 per ton of paper boosts wet Mullen values 300%, raises dry Mullen and fold values 10 to 30%, and increases wet rub and scuff resistance, wet and dry tensile.

In paper toweling, UFORMITE 475 eliminates the see-saw relationship that has made a strong, absorbent towel a hard-to-realize ideal. In twisting tissue, too, the resin prevents breakage on paper-twisting machines. And in bags; reproduction or printing papers; glassine; tasteless, odorless, grease-proof wrappings, the UFORMITES provide the high wet strength your customers want.

And low price is not the only saving. With the UFORMITES, there's no pretreatment necessary, no special processing or equipment. Just add UFORMITE 467 (for kraft bags, etc.) at the beater, or UFORMITE 470 (for high pH kraft, groundwood, and sulfite) anywhere at the wet end after the Jordans. With the UFORMITES, you'll improve the sizing efficiency of rosin and the retention of beater additives. For full information on UFORMITES—plus samples of these resins—write today. There's no obligation.

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Your copy of this free booklet will answer your technical questions about the UFORMITES, and how they are used to increase wet strength. Send for it today.

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AMBERLITE W-1—A water soluble polymer for improving the dry and wet tensile and Mullen, as well as the fold and the abrasion resistance of paper.

RHOZYMES BB and E-5—for enzyme conversion of starch.

TAMOL N—for effective pitch control—a dispersing agent for pigments.

TRITONS—Surface-active agents with a score of uses in paper manufacture—in caustic cooking of cotton fiber, as a dispersing agent for pigments and metallic soaps, emulsion-type coatings.

The Hydrosulfites—Reducing agents for stripping color from rag stock or for bleaching pulp.

HYAMINES—Deodorants for paperboard and glue bactericides.

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CHEMICALS FOR INDUSTRY

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The Resinous Products Division was formerly The Resinous Products & Chemical Company

with this showing that French Overseas Territories wil need $5,300,000 in forestry equipment: additional developments under consideration for The Netherlands Overseas Territories involving further investment in forestry undertakings in Surinam and for plans to be considered for the production of kraft paper in Indonesia.

Pulp and Paper, $69,300,000

WASHINGTON—Procurement authorizations for pulp and paper from the beginning of ECA operations, April 3, 1948, to June 1, 1949, total $69,300,000, the agency reports. Authorizations the week ending June 12 totaled $231,000.

U.S. Tall Oil to U.K.

WASHINGTON — The ECA allotted $16,000 for tall oil from the United States, for the United Kingdom for the fourth quarter, 1949, during the week ended June 18.

OBITUARIES

John H. Shulster, 76, long employed by the Pequannock Paper Co., Butler, N. J., as a fireman, died at his home in Bloomingdale, N. J., on June 12. Surviving are his widow, Mrs. Harriet Kimble Shulster; two sons, Ernest and Edgar; a daughter, Mrs. Joseph Minnick; and two sisters, Mrs. Burt Miller and Mrs. Mary Ellen Hopper.

Henry Taylor Smith, 85, treasurer of Bradner Smith & Co., Chicago, died at his home in nearby Evanston on June 7. Mr. Smith was associated with the firm for 68 years. Surviving are his widow, Mrs. Gertrude J. Smith; two daughters, Mrs. David Dushkin and Miss Gertrude P. Smith; and a sister, Miss Harriet W. Smith.

Charles Bernard Bleyler, co-founder of the Bleyler & Fisher Co., Buffalo, N.Y., died on June 13 in Valatie, N.Y. Mr. Bleyler had been president of the company from 1905 to 1919 and also had been president and general manager of Great Northern Warehouses, Inc., at Syracuse, N.Y.

Alexandre Lascelle, 63, on the staff of the International Paper Co. for the past 48 years, died suddenly of a heart attack in Hawkesbury, Que., on June 9. He was a councilor for Centre Ward of Hawkesbury for the past 12 years. Surviving are his widow, three sons and five daughters.

Julius St. Cyr Watson, comptroller of the Fulton Paper Co., Atlanta, Ga., died on June 10 in Panacea, Fla., after an illness of several months. Surviving Mr. Watson are his widow and two daughters.

Myer D. Finkelstein, 73, waste materials dealer for the past 25 years, died in City Hospital, Holyoke, Mass., on June 13.

John H. Pratt, 83, former president of the old firm of A. Dougherty, Inc., playing card manufacturer, now merged into the Consolidated Playing Card Co., New York City, died at his home in Rye, N. Y., on June 13. A son, John H. Pratt, Jr., survives.

Fred H. Patee, 86, who at the time of his retirement in 1936 was connected with the sales force of the Plymouth Paper Co., Holyoke, Mass., died at his home in that city on June 13, following a long illness.

FOREIGN

Ireland

In the first three months of 1949, the Republic of Ireland imported 1,406 tons of papermaking materials, valued at £45,560, against 2,514 tons, valued at £45,676 in the first quarter of 1948.

Imports of coated printing paper during the 1949 period amounted to 4,065 cwts., valued at £19,741, the figures for the 1948 period being 4,248 cwts., valued at £25,719.

Newsprint imports during the first quarter of 1949 were 65,753 cwts., valued at £140,465 as against 45,312 cwts., valued at £87,422 in the corresponding period of 1948; and of other uncoated printing paper, 9,954 cwts. valued at £35,583, as against 20,915 cwts., valued at £97,209 in the 1948 period.

Imports of writing paper in large sheets were 2,603 cwts., valued at £11,885 in the first three months of 1949, and 5,595 cwts., valued at £27,428 in the corresponding period of 1948.

The total value of imports of paper, cardboard, etc., during March, 1949, was £313,770 against £279,674 in March, 1948. This brings the total value of these imports for the first three months of 1949 to £781,521, against £926,305 in the corresponding quarter of 1948.

In March, 1949, £23,617 worth of paper and cardboard, etc., were exported from the Republic, the value for March, 1948, being £7,237. The total value of these exports for the 1949 quarter was £79,648 as against £23,697.

Re-exports of these commodities during the quarter under review were valued at £1,290 compared with £415 in the corresponding period of 1948.

Colombia Multiwall Bag User

WASHINGTON—A possible market for shipping sack paper is seen in Colombia as a result of increasing demand from the local cement industry, according to the Department of Commerce.

The increasing demand for shipping sacks from that industry, it was said, may indicate an export opportunity for United States shippers. A new Portland cement plant near Barranquilla, now producing 300 tons daily, was said to be using shipping sacks from Sweden, as well as domestically-produced sacks. The plant contemplated importation of an additional 500,000 sacks from Sweden, but was denied an import license. It was feared that an attempt to import from the United States might be similarly blocked. However, the firm was said to be depending on the domestically-made sacks, which were described as of 3-layer type, each layer of 60-pound strength, rated at a total of 180 pounds; this compares with 4 layers rated at 180 for the Swedish product.

Indian Industries Bill

NEW DELHI — Among the industries which will come under the control of the Industries (Development and Control) Bill which has been introduced in the Constituent Assembly of India will be paper and newsprint, states Richard Grew, Commercial Secretary for Canada here.

If passed at the next session of the Assembly in September, this Bill should have far-reaching effects on the decisions of those who contemplate the investment of foreign capital in that country, Mr. Grew adds.

All existing industrial undertakings will have to be registered within a period of three months from the date of the commencement of the Act, he continues, nor may any new industrial undertaking be established without a license. A license may contain conditions as to the location, size, equipment and technique of a new undertaking. If an established industrial undertaking contemplates substantial expansion, a license will be required, subject to the same rules as a new undertaking.

The Bill provides that an advisory council is to be set up to advise the central government on matter concerning development, control and regulation of any controlled industry. The Bill permits also the central government to delegate an officer to enter and inspect any premises, order the production of any records that might be required and examine any person having control of or employed in a controlled industry.

R. S. Aries Visiting Central America

Robert S. Aries, New York, consulting engineer and adjunct professor of chemical engineering at the Polytechnic Institute of Brooklyn, N.Y., is on a business tour of Mexico, Guatemala, Jamaica and Cuba. Traveling for undisclosed American interests, Dr. Aries will survey some of the chemical, forest products and sugar industries in the area and is expected to be back in this country in August.

Portugal Increasing Paper Production

LISBON — Industrial equipment expected to be required in 1949-1950 by Portugal in its program for increased national production does not exceed $18,400,000, including equipment for the paper industry, states R. T. Young, area officer, Canadian Trade Commissioner Service.

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ASSOCIATIONS . . .

Superintendents' 21st Annual Convention

Atlantic City—June 15-17

The 29th annual convention of the American Pulp & Paper Mill Superintendents Association was officially started in Haddon Hall, Atlantic City by Ollie W. Messner, national president, at 9:30 a.m., June 15.

Rev. J. Stanley Wagg, pastor of St. Paul's Methodist church, Atlantic City, pronounced the invocation and later said a prayer for members who have passed on during the period from May 1, 1948, to May 31, 1949. The entire group stood in silent tribute while the following list of deceased was read by Secretary-Treasurer George Craigie: Otto A. Herman, Thomas C. Bowen, George W. Mabee (Hon. Member), William J. Kennedy, Edward F. Marshall, Edward F. McWhirter, Walter J. Stinson, William H. Verhagen, Agna B. Hanson, Douglas B. Armstrong, Edward A. Weber, G. A. Armbruster, Edward A. Feicht, Michael J. Flemming, William C. Law.

The president's report was then submitted by Mr. Messner as follows:

I feel very honored and deem it a special privilege to call to order the 29th Annual Convention of the American Pulp and Paper Mill Superintendents Association. I wish to extend a hearty welcome to every member, affiliate and friend of the Association who is assembled here.

On June 17, 1943, at the Commodore hotel in New York City, you elected me 5th vice-president of your Association. How well I recall that day — it seems only yesterday. I remember that I remarked I would do my utmost to carry on with this new assignment as 5th vice-president and that I would work diligently in the future as I have tried to in the past. I cannot emphasize too strongly the fact that I have been well paid for anything I have accomplished or contributed for our organization, for in return I gained many dear friends. I will always remember the past 5 years as the most enjoyable years of my life. I will remember the fine friends I have made who so willingly and unselfishly helped me during these years with their understanding and wholehearted support.

JAMES FISH
Superintendent
Erving Paper Co.
First Vice-President

CHARLES H. REESE
Manager of Manufacturing
Nekoosa-Edwards Paper Co.
President

I am thankful to Mr. Ralph Powers, president of Robertson Paper Box Company, Montville, Conn., for his generous financial support in enabling me to carry on the various functions of my office during the past years.

I have earnestly endeavored to maintain the fine leadership which our organization has experienced for many years. I feel that our organization has been of real value to the paper industry. I deeply regret that it was impossible for me to attend all the divisional meetings. Those I did attend, the Northeastern Division at Poland Spring, Maine, and the Penn-New Jersey-Delaware Division at Atlantic City, N. J., were very interesting and were well attended.

I would like to thank the division officers who handle the divisional meetings. They have fulfilled their responsibilities very satisfactorily. Our good fortune continues in that we have such divisional officers who so capably make these meetings interesting and worthwhile.

Our membership now totals 1,430, with new members increasing every month. The increase has come from almost every state in the country and also from Canada.

We have had a large amount of requests for our Chemical and General Maintenance Books which seem to be very helpful in the paper industry. A copy of the 1948 Year Book, as each year, was sent to the presidents of mills in which we had members as well as to presidents of mills where we had no members. In each case we wrote a personal letter telling of our wish to be of service to the industry. The response to this mailing in applications for membership, and in assurance of support, was most encouraging and gratifying.

The Planning Committee held a meeting at the Canadian Club, New York, on February 21, 1949. Various subjects were discussed at this meeting. Particular attention was given to plans for increased cooperation between our affiliates and our members. Monday afternoon of this week the William Rittenhouse Plaque was erected in Fairmount Park, Philadelphia, Pa., marking the site of the first paper mill erected in the United States. Mr. Harry E. Weston, associate secretary-treasurer, and his committee should be commended for the splendid work in connection with the erection of this marker and the various other activities performed by this committee.

Our official magazine, and the other publications serving the paper industry, have continued to give our association their support. I wish to express my appreciation to the publishers of

CHARLES E. ACKLEY
Mill Superintendent
Crown Zellerbach Corp.
Second Vice-President

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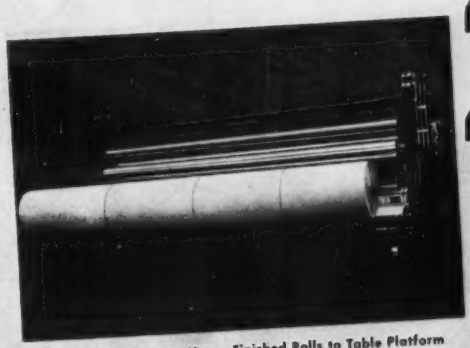
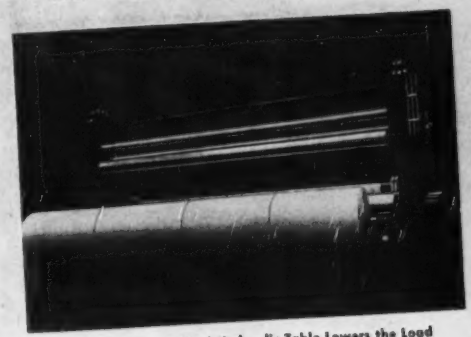


Motor Driven Ejector Moves Finished Rolls to Table Platform



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ON THE SOCIAL SIDE OF THE SUPERINTENDENTS' CONVENTION

Pictured above (1) Bob Long, Container Corp., Chicago; Mrs. Long; J. Kubicka, Container Corp., Chicago; Mrs. Kubicka; (2) Mr. and Mrs. C. W. Hayden. (3) Dinner group about to enjoy seafood at Hackney's. Left to right: Mrs. J. Fiori; H. J. Abernathy, Continental Paper Co.; Mrs. L. B. Owen; Walter Casola, Continental Paper Co.; Miss Rosalie Fiori; L. B. Owen, Champion International Paper Co.; Miss Marie Fiori; Master J. Fiori and Master J. Woodside; Larry Woodside, Albany Felt Co.; Mrs. J. Kryszak; E. P. McGinn, Paper Trade Journal; Mrs. L. Woodside; J. Fiori, Stone Container Co.; J. J. Kryszak, Wisconsin Tissue Co. (4) A group at the Friday night banquet; (5) The quartet at practice: Frank Olsen, Vance Vallandingham, Mrs. Vallandingham, and Mrs. G. E. Lockwood.

these publications for their fine support and trust the friendship and cooperation which has existed heretofore will continue throughout the coming years.

The American Paper and Pulp Association has continued to extend to our organization their usual good service and support. In this respect, a joint safety committee, comprising representatives from the American Paper & Pulp Association and the American Pulp and Paper Mill Superintendents Association, was established on January 7, 1949. Much is hoped to be gained

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GLEN SUTTON
Superintendent
Sutherland Paper Co.
Third Vice-President

through the establishment of this committee. I wish to extend my thanks to those men who serve on this committee and to wish them success in launching its activities.

I could not over-emphasize the support our affiliates have given our association and the paper industry. Their contributions, financial and otherwise, have been most generous. The benefits derived from our relationship and friendship with the suppliers to the paper industry are encouraging and I sincerely wish them continued success and progress.

An award was recently made in Washington, D. C., to our Association for the contribution it has made to the paper industry. This award was the result of our entry in a nation-wide competition in which Honorable Charles Sawyer, Secretary of Commerce of the United States, was the awarding committee chairman. Our association can be justly proud of this presentation.

The Technical Association of the Paper Industry and the Technical Section of the Canadian Pulp and Paper Association and the Institute of Paper Chemistry continue to serve in their capacities and have shown a fine spirit of cooperation. This cooperation and their service to the paper industry is appreciated by all.

Our New York office continues to faithfully serve and aid all members and affiliates. I want to thank Mr. George W. Craigie for all his assistance to me. He has shown a fine spirit of cooperativeness and willingness to help in any capacity. He is to be commended for his splendid work in our organization.

The Chicago office, under the capable supervision of Mr. Harry E. Weston, is being operated to give further aid to members and affiliates of our organization. All entries to the Gimmick Contest which was announced on April 16, 1949, have been submitted to Mr. Weston. I realize that he has had his hands full and I appreciate the fine job that he is doing. The results of the Gimmick Contest will be announced June 17th at this convention. May I thank Mr. Harry Weston for his time and effort in connection with this contest and all others who have contributed to make this a success. I deeply appreciate Mr. Weston's assistance to me during my year in the office.

I feel that without the experienced counsel and guidance of our trustees, officers, directors and committee chairmen, I could not have carried out the various duties and functions of my office properly. You have given freely

GORDON L. SINGLETARY
Plant Manager
Brunswick Pulp & Paper Co.
Fourth Vice-President

of your time, listened patiently to my problems, and were always prompt when the call for help went out. Gentlemen, thank you for helping me with this job of which I have been very proud. It has proven an education in itself.

In closing, I wish to thank you for the honor of having been your president. I'm deeply grateful to all of you for your kind help. My earnest desire is to see our association grow, and grow, and continue to furnish further aid to its members, its affiliates, and to the paper industry.

The presentation of resolutions by Mr. Weston, chairman of the Resolutions Committee followed the presidential report.

Mr. president, officers and members of the American Pulp and Paper Mill Superintendents Association, Inc.:

Your resolutions committee has drawn up a number of resolutions and is pleased to submit them for your consideration. The resolutions follow:

1. Whereas, production facilities of the industry apparently have definitely closed the gap between demand requirements and available supply of paper and paperboard, as indicated by reduced operating hours on the part of some of our mills and by lower price quotations on certain grades of paper and paperboard,

BE IT RESOLVED: That every Association member, each in his own way and for the continued best interests of his employer, do everything possible to maintain a high level of employment commensurate with profitable mill operation.

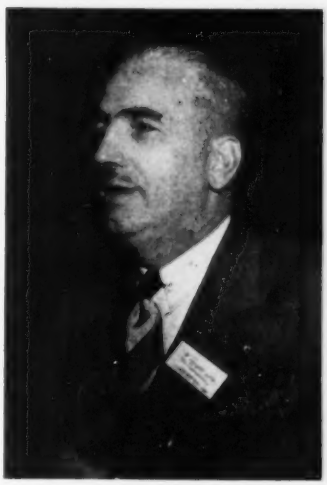
2. Whereas, the ten divisions of the Association are so strategically located that they can promote an almost on-the-job kind of meeting;

BE IT RESOLVED: That every division place greater emphasis than ever before on programs that will make for better industrial leadership in the industry—programs that will cover Men, Machines and Know-How and will result in better labor relations, better machines, and better technology.

3. Whereas, our Association has undertaken a joint safety project with the American Paper and Pulp Association in an effort to reduce the accident frequency rate of the industry,

BE IT RESOLVED: That every mill member of the Association participate in this actively in so far as management policies of the various mills will permit.

4. Whereas, the Association continues its effort in promoting the preparation of reports and monographs on a wide variety of highly important subjects for the benefit of the members



DONALD DICK
Manager
Howard Smith Paper Mills
Fifth Vice-President

and of the industry as a whole,

BE IT RESOLVED: That each member, whether mill or affiliates, if called upon to participate in one or more of these projects, do everything possible to meet each request in order that the work can be speeded up and finished within a reasonable length of time.

5. Whereas, Ollie W. Messner, as President of the Association during the past year, in spite of unsettled conditions in his own work graciously did everything possible to keep the busjness of the Association running smoothly and even to extend its horizons,

BE IT RESOLVED: That he receive the thanks of the entire membership for his deep interest in the affairs of the Association and for such advances as the Association has made during his term of office.

6. Whereas, the Allied Industrial Affiliates Committee of the Association has been unusually active in promoting the affairs of the Association,

BE IT RESOLVED: That this committee and the Allied Industrial Affiliates group as a whole, receive the plaudits of the Association for each and every accomplishment that came from these activities.

7. Whereas, divisional activities are a vital factor in the growth and development of the national Association,

BE IT RESOLVED: That due recognition be given to each of the ten divisions of the Association, and to their respective officers, for all work done in the interest of promoting Association affairs—both divisional and national.

8. Whereas, this convention represents the 30th anniversary of The American Pulp and Paper Mill Superintendents Association, the organization meeting having been held on June 3-4, 1919, in Appleton, Wisconsin,

BE IT RESOLVED: That anniversary congratulations be extended by the Association membership to each of those persons still living who participated in the organization meeting and that these congratulations in some way serve as a special tribute to Fred C. Boyce, first active president of the Association and a dynamic leader and officer of the Association ever since.

Sulphite Panel (left to right): E. F. Tucker, Stebbins Engineering Co.; Harold Skinner, Marathon Corp.; H. Karberg, Alliance Paper Mills; Vance P. Edwards, International Paper Co., Co-Chairman; Donald A. Hunter, B.F.D., Ogdensburg.

9. Whereas, the Commissioners of Fairmount Park, Philadelphia, Pa., courteously gave the Association permission to erect a bronze marker as a tribute to William Rittenhouse, America's first papermaker, within the confines of Fairmount Park, near the actual site of the Rittenhouse mill, the marker having been dedicated on the afternoon of June 13,

BE IT RESOLVED: That this resolution serve as the printed record of our appreciation for this act of the Commissioners.

10. Whereas, Paper Mill News, official publication of the Association, and certain other magazines, making up the business press of the industry, have contributed space in their respective columns, so generously and unselfishly, during the past twelve months to Association news and features,

BE IT RESOLVED: That this support of the press receive the commendation and thanks of every member of the Association.

Respectively submitted,
Raymond Bennett
Charles Reese
Harry E. Weston, Chairman

The report of the auditing committee was submitted by the chairman, Charles Reese.

The report of the nominating committee was submitted by William Brydges, placing the following in nomination:

President—Charles H. Reese, Manager of Manufacturing, Nekoosa Edwards Paper Co., Port Edwards, Wisconsin.

First Vice-President—James Fish, Superintendent, Brown Co., Berlin, N.H.

Second Vice-President—Charles E. Ackley, Mill Superintendent, Crown Zellerbach Corp.

Third Vice-President—Glen Sutton, Superintendent, Sutherland Paper Co.

Fourth Vice-President—Gordon K. Singletary, Plant Manager, Brunswick Pulp and Paper Co.

Fifth Vice-President — Donald R. Dick, Howard Smith Paper Mills, Ltd., Cornwall, Ont., Canada.

The entire slate was then elected by a voice vote which will later be confirmed by a ballot.

With the exceptions of Glen Sutton and James Fish, who were unable to attend the meeting, all of the newly elected officers gave short talks, thanking the members for the honor and pledging their utmost in furthering the interests of the association.

The meeting then proceded with the General Conference, the first paper of which was "Jordan Plug Pressure Control and Recording System" by Bruno E. Prevost, Emerson Mfg. Co. This was followed by "Cost Accounting as an Operating Tool" by C. E. Patch, Morton C. Tuttle Co.

Demonstration of ion exchange coating on a Waldron "Precipi-set" Coater, at the Coating Session.

The Wednesday afternoon session included three group meetings. The wood-room and woods operations group was presided over by Harry Weston, chairman, and C. P. Robinson, co-chairman. Papers included "Current Issues in Chipper Design," by C. R. Wardwell, Carthage Machine Company, and "Latest Developments in the Production of Pulpwood," by W. S. Bromley, forest engineer, American Pulpwood Association. A film entitled "King Spruce" was presented through the courtesy of the Brown Company.

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- Sodium Hyposulfite
- Sodium Metasilicate
- Sodium Silicate
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- Sodium Thiosulfate
- Sulfuric Acid
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The session on coated papers was presided over by Brainerd E. Sooy, Gardner Board and Carton Company, chairman, and A. C. Dreshfield, consulting chemical engineer, co-chairman.

A panel discussion on "Machine Coating Binders" had the following panel members and subjects: A. C. Dreshfield, moderator; H. O. Ware, Hercules Powder Company, "Casein"; Dr. J. E. Killinger, Penich and Ford Ltd, "Cooked Starch"; W. L. Craig, R. T. Vanderbilt Company, "Enzymic Starch"; W. L. Bain, Glidden Company, "Alpha Protein"; E. K. Stilbert, Dow Chemical Company, "Latex."

Papers were then presented as follows: "A new coating process involving ion exchange," by D. R. Erickson, consulting chemist, Graphic Arts Laboratories, and "The Place and Future of Machine Coating in the Industry," by B. R. Newcomb, John Waldron Corporation.

The mill maintenance group was conducted by Gordon K. Singletary, Brunswick Pulp and Paper Company, chairman, and F. H. Cole, Walworth Company, co-chairman. The following papers were presented: "Power Plant Maintenance," by William P. Jordan, Ecusta Paper Corporation; "Maintenance of Anti-friction Bearings in Paper Mills," by George H. Spencer, The Torrington Company; "Maintenance of High Speed Paper Machines," by C. P. Spalding, Beloit Iron Works.

On the morning of Thursday, June 16, the three group meetings were opened at 9:30 a.m. Chairmen of the Fine Paper and Tissue group were J. O. Julson, B F D Division, Diamond Match Company, and James Rogers II, J & J Rogers Company. Papers presented to this group were: "Ramblings of a Tissue Mill Superintendent," by J. O. Julson; "The Modern Supercalender," by E. E. Thomas, Appleton Machine Company; "Electroplating for Paper Machinery," by C. H. Belvin, Chromium Corporation of America; two films, "Modern Winders and Rewinders" and "Modern High Speed Supercalendering," were presented by Appleton Machine Company.

"Production of Mold Resistant Paper and Paperboard," by William D. Stitt, Buckman Laboratories, was presented by title.

The Sulphite session consisted of a panel with Donald A. Hunter, B F D Division, Diamond Match Company, as chairman, and Vance P. Edwardes, International Paper Company, as co-chairman. Members of the panel included: E. F. Tucker, Stebbins Engineering Company; Harold Skinner; Marathon Corporation; H. Karberg, Alliance Paper Mills; Roy Davis, Detroit Sulphite Pulp & Paper Company; Luther Beighey, Hammermill Paper Company.

Glen Renegar, Container Corporation, was chairman of the Board group, and Walter B. Morehouse, Nopco Chemical Company, was co-chairman. A paper entitled "Sveen-Pedersen Savealls in Board Mills and Re-Use of White Water" was presented by Paul Easton, Bulkley Dunton Company.

The subject "Approach flow and factors of vat design for uniform formation and weight distribution" was discussed by a panel whose members presented papers as follows: Philip Goldsmith, Pusey & Jones Corporation, "Approach Flow to Cylinder Vats"; T. A. McArn, Downingtown Manufacturing Company, "Approach Flow to Cylinder Machines"; S. T. Weber, Black-Clawson Company, "The Hydronamic Flow System for Vats."

The joint luncheon for ladies and men was held in the Vernon Room Haddon Hall. at 12:30 p.m. on Thursday. Charles Reese, president elect, presided. The principal speaker was Dr. Allan A. Stockdale, staff lecturer, National Association of Manufacturers, whose subject was "The Business Man Looks Ahead." From his speech and manner it was evident that Dr. Stockdale not only looks forward with enthusiasm, but has the ability to inspire others to do so. He told of the great accomplishments that have been made since he was a boy and listed numerous things which we take for granted but which were considered impossible thirty or forty years ago. Dr. Stockdale decried the pessimistic attitude of many people who think our country has completed expanding and improving, and insisted that progress in the future should greatly exceed that of the past. He also suggested that people stop wishing for a return to the "good old days," which would probably be very disappointing, and look to the future. His formula for solving present-day problems is the old one that has always been successful, hard work.

Brainerd E. Sooy, Gardner Board & Carton Co., and A. C. Dreshfield, Consulting Chemical Engineer, Chairman and Co-Chairman of Coating Session.

J. P. Critchlow and D. R. Kroell, Authors of the paper "Lubrication and its Effect on Paper Mill Maintenance and Operating Costs."

Joseph J. Kryszak, Wisconsin Tissue Mills; Harry E. Hadley, Gardner Board & Carton Co.; and Larry Woodside, Albany Felt Co., discuss papermaking problems.

There were three group meetings Thursday afternoon. Phillip J. Hannan, Southern Advance Paper Company, and Allen Hyer, Bagley & Sewall Company, were chairmen of the Kraft session at which the following papers were presented: "Use of Chip Weightometer in Kraft Mill Operation," by Fred W. Bishop, Southland Paper Mills, Lufkin, Texas; "Care and Use of Chipper Knives," by Collins B. Newall, Simmonds Saw and Steel Company; "Balanced Treatment of Papermaking Fibers," by A. W. White, Jr., Shartle Bros. Company.

The session on Power was conducted by Roland A. Packard, Bagley & Sewall Company, chairman, and C. D. Cummings, S.K.F. Industries, co-chairman. The following papers were presented: "Lubrication and its Effect on Paper Mill Operating and Maintenance Costs," by J. P. Critchlow and D. R. Kroell, Gulf Oil Corporation; "Effect of Condensate and Air on Output, Quality and Steam Consumption of Paper Machine Dryers," by Albert Milnes, Sarco Company. A colored sound film, "Steam for Power," was presented by Babcock & Wilcox Company, New York, N. Y.

Robert W. Pattison, Cellulose Fibres Inc., was chairman, and F. A. Soderberg, General Dyestuff Corporation, co-chairman of the Graphic Arts meeting. The following papers were presented: "Paper Testing in Relation to End Use," by M. S. Kantrowitz, U.S. Gov't Printing Office; "New Paper for New Inks," by George Cramer, Sinclair & Valentine Company; "Paper—The Printers Raw Material," by Robert W. Pattison, Cellulose Fibres Inc.

At 9:30 a.m. Friday, a general conference on Materials Handling in Pulp and Paper Mills was conducted by Charles H. Reese. Mathew W. Potts, consultant, presented data obtained from various pulp and paper mills and acted as moderator during the discussion. Several films on materials handling operations and equipment were shown, including one which showed the Jervis Webb installations at Macon Kraft Company, Macon, Ga

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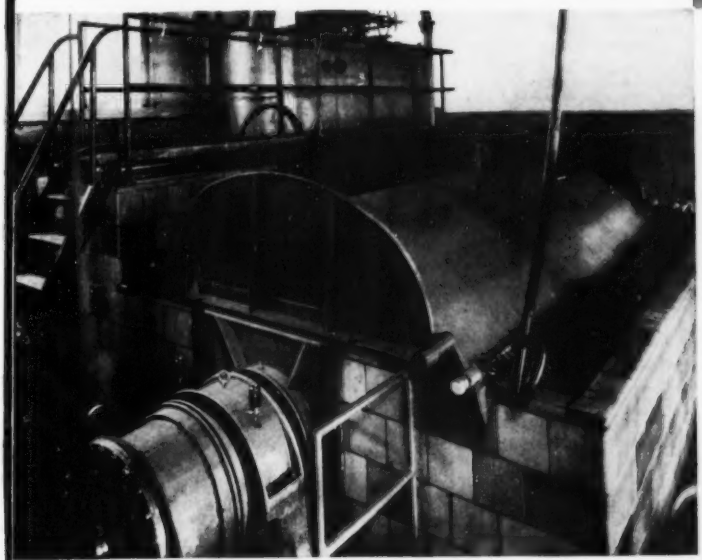

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On Friday afternoon, the general conference was continued with a talk by Walter Fried, consulting engineer, on "Supply, Demand, Money and Prices."

At 6:00 p.m. on Friday both the ladies and men were guests of the Industrial Affiliates group at a cocktail party in the English Lounge of Haddon Hall. This was followed by the banquet in the Vernon Room at which Ollie Messner, retiring president, was toastmaster. Group singing was conducted by Harry Hulmes.

Fred W. Boyce, first president of the Superintendents Association, was presented with a huge birthday cake to commemorate his 80th birthday, which will soon arrive. Mr. Boyce presented Ollie Messner with the past presidents medal and William Brydges presented gifts to Mrs. C. H. Reese and Mrs. Ollie Messner.

The principal speaker at the banquet was Earl W. Brydges, N.Y. State Senator and son of Mr. and Mrs. William Brydges. Senator Brydges talked on Americanism and told of the efforts being made in New York State to weed out from the school system teachers whose beliefs were contrary to American ideals. Senator Brydges also warned that government participation in business must be removed and government returned to its rightful function of acting as an umpire.

After the banquet there was dancing until 1:00 a.m.

The ladies program was under the direction of the following committee: Mrs. Ollie W. Messner, chairman; Mrs. Charles H. Reese; Mrs. James Fish; Mrs. Charles E. Ackley; Mrs. Glen Sutton; Mrs. Gordon Singletary; and Mrs. Frank Frothingham. The program included activities on the beach and boardwalk as well as a quiz contest, bingo and card games and several moving pictures.

Industrial affiliates of American Pulp & Paper Mill Superintendents Association held their annual dinner in the Rutland Room, Haddon Hall, Tuesday, June 14, at 7:00 p.m. F. F. Frothingham, Bird Machine Company, chairman of the group, presided. After presenting his report, Mr. Frothingham conducted the formal election of officers for the coming year. The following were elected: Chairman, F. A. Soderberg, General Dyestuffs Corporation; 1st vice chairman, Allan Hyer, Bagley & Sewall Company; secretary-treasurer, Harry E. Weston.

Representatives of the various trade papers were guests of Harry Weston at a breakfast in the Rowsley Room at 8:00 a.m. Wednesday.

MISCELLANY . . . .

Southern PTA Meet, Sept. 8-10

JACKSON, Miss.—Ran I. Fox, president of the Southern Paper Trade Ass'n., reports that the annual meeting will again be held at the Buena Vista Hotel, Biloxi, Miss., September 8-10

Industry Replants 60,000 Acres

ATLANTA — The pulpwood industry in the South expanded its tree planting program by more than 100 percent over last year's activity, as reported by H. J. Malsberger, general manager of the Southern Pulpwood Conservation Ass'n. All pulp, paper, and board mills in the territory supplied the information for the survey.

The pulpwood industry was responsible for having planted 56 million pine trees, of which 11½ million were contributed to small landowners. The remaining 44½ million trees were planted on lands owned by the industry. This constructive action by the pulpmills resulted in placing about 60,000 additional acres of worthless land well on the way toward producing a money crop of trees within 15 to 20 years. The industry purchased 42½ million trees from State forest nurseries and grew the remainder in their own nurseries.

The pulp, paper, and board industry cut approximately nine million cords of pulpwood last year. In being responsible for planting 56 million trees this year, they have accomplished a 62 percent replacement in pine plantations of the number of trees utilized last year. This likewise exactly doubles the replacement accounted for in last year's planting program.

In addition to the planting program which is reclaiming thousands of acres of worthless land, the industry, through the Southern Pulpwood Conservation Ass'n., is cooperating with all public forestry agencies in working for the rapid expansion of fire control services on the millions of acres of naturally stocked lands needing this protection throughout the area. This program is growing many more trees than are being planted, but the lands being planted could not otherwise grow a tree crop. These combined efforts are resulting in growing more trees for the future use of all wood using industries.

The members of the Southern Pulpwood Conservation Ass'n. are responsible for 85 percent of this total tree planting activity.

Marshall Plan Aids Cartiere Burge

WASHINGTON — Use of Marshall Plan funds to help pay for a project to modernize and integrate the Cartiere Burge paper mills at Verzuolo and Corsico, Italy, has been approved by the ECA, it was disclosed in Washington and Rome on June 18.

ECA approved the use of $1,650,000 in recovery funds for the purchase of machinery and equipment in the United States. The Cartiere Burge Co. will furnish an additional one billion lire to meet other costs of the project.

Machinery and equipment necessary for the project include machines and machine parts, electrical motors and equipment, piping valves, vats and various items of special equipment such as machines for groundwood production, fork lift trucks, control instruments and laboratory instruments.

The modernization program is aimed chiefly at increasing newsprint production, and it is estimated that completion of the project will permit an increase in the newsprint output of the two plants from about 210 metric tons per day to 295 metric tons per day.

Cartiere Burge is Italy's largest producer of paper, accounting for about one-third of the national production. Its present output represents a large percentage of the newsprint manufactured in Italy. It also produces a wide variety of other types of paper including kraft, book paper, rag paper and others.

The company's properties include 11 paper and pulp mills in Italy, a pulp mill in Austria and a hydro-generating plant on the Po River.

Calder Honored By Press Ass'n.

GALVESTON, Tex.—The Texas Press Ass'n. sponsored a banquet here June 16 honoring Louis Calder of New York, president of the Perkins-Goodwin Co., for his part in organizing the Southland Paper Mills at Lufkin, Tex.

Lieutenant Governor Allan Shivers bestowed on Mr. Calder honorary Texas citizenship. John Ewing, publisher of the Shreveport (La.) *Times*, was toastmaster at the banquet. Speakers included Gene Howe, of the Amarillo *Globe-News;* Nathan Adams, chairman of the board of the First National Bank in Dallas; and Lieutenant Governor Shivers.

Pioneer-Flintcote Safety Record

LOS ANGELES—A low frequency rating of 2.62 accidents per million man hours places the Pioneer division plant of the Flintcote Co. in fifth place in the Paper Industry Safety Contest being conducted by the National Safety Council. There are 56 firms competing in the Group A division in which this plant is grouped.

Libby Awarded CE Degree by U.M.

ORONO, Maine — Clarence E. Libby of Syracuse, N.Y., head of the department of pulp and paper manufacture at New York College of Forestry, was awarded the professional degree of chemical engineer at commencement exercises at the University of Maine on June 12.

Union Bag Advances Naudain

NEW YORK—Albert G. Naudain has been named assistant to Leonard J. Doyle, vice-president in charge of bag and paper sales of the Union Bag & Paper Corp. Mr. Naudain joined Union Bag upon his graduation from the University of Alabama in 1938.

Two New Members of SAPI

NEW YORK — Wm. B. Meyer of the local Kimberly-Clark Corp. offices, and Charles H. Zittel of the Holyoke Card & Paper Co., Springfield, Mass., have been admitted to membership in the Salesmen's Ass'n. of the Paper Industry, Eastern division.

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A reproduction of this incident from the fabulous life of Paul Bunyan—the forty-third of a series—will be sent on request. It will contain no advertising.

Superstandard Newsprint Demand

TORONTO, Ont.—Now that newspaper publishers feel a little easier regarding their newsprint supplies and are in a better position to demand the quality of newsprint they want, and competition becoming keener all the time, not only between publications, but by the manufacturers of all nationally distributed products, a greater demand is expected for superstandard newsprint.

Most of the demand for premium grade newsprint has, so far, come from the Sunday and week-end newspapers, but competition for the advertising dollar is causing some publishers to look for news grades which will do a better reproduction job. The publisher, in some cases, finds himself being pushed into demanding the superstandard by his advertisers, who are also feeling the rising tempo of competition. Colored pages for sales appeal are coming back and Sunday papers require more and more of the better grades of newsprint, especially for rotogravure sections.

As yet the total output by Canadian mills of superstandard newsprint is quite modest and amounts to a small percentage of total newsprint sales. Newsprint men seem to be convinced, however, that the demand for this type of newsprint will grow. Most of Canada's largest mills make at least some of the superstandard papers. There are several types on the market.

Abitibi Power & Paper Co., Consolidated Paper Corp., Price Bros., St. Lawrence Paper Mills and others all have various grades of superstandard newsprint paper. Sunday papers are paying $10 to $25 a ton premium for this better newsprint and these papers are increasing in importance. Generally speaking, U. S. publishers are strong advocates of higher grade newsprint and the increase in circulation of Sunday papers has strengthened the demand.

Canadian newsprint mills are happy to supply the grades of paper their U.S. customers demand and are naturally glad to get the premium price, but, as in so many other industries, there has always been difficulty over U.S., customs officials' interpretation of the customs rules. It has long been a complaint, not only of Canadian manufacturers, but all manufacturers, trying to sell in the U.S. market, that if the importation of the goods could not be stopped one way, there was always another—the customs officials could choose to put their own interpretation on the regulations.

"Standard newsprint" is the only grade of Canadian paper permitted free entry to the U.S. Originally, that meant any kind of paper the publishers wanted to use. Gradually, definitions of newsprint changed. U.S. Treasury Department rulings on what constitutes "standard newsprint" eventually determined the weight, width of rolls, percentage of groundwood and sulphite pulp, type of finish, ash content, color and degree of sizing. These stiff regulations have been ameliorated in so far as the ash content is concerned. The 2 percent formerly allowed has been raised to 6½ percent ash, which permits a greater clay content with a consequent greater body and better finish.

There is still another hurdle, however, not calculated to smooth the passage of commodities U.S., business requires and Canadian business is eager to supply. Newsprint finish is tested by an Ingersoll glarimeter to determine the gloss. Newsprint manufacturers are not familiar with this device and make their own laboratory tests. Newsprint admitted free of duty to the U.S., must show less than 50 percent glare on this glarimeter. It is understood that the measuring device is not available to Canadian manufacturers, so when standards differ, there is likely to be trouble.

The history of the so-called "standard newsprint" is long, rocky and strewn with many test cases, according to the *Financial Post*, Toronto, which says that about all that stands in the way of higher grade newsprint for U.S., publishers are the U.S. Treasury Department rulings on what constitutes "standard newsprint."

Waste Materials Dealers Petition

BROOKLYN, N.Y.—A six-point program to aid waste paper dealers and increase the amount of waste paper consumed was presented on June 17 to Secretary of Commerce Charles Sawyer in a letter from the United Waste Material Dealers of the New York metropolitan area. The letter to Secretary Sawyer follows:

The Waste Paper Industry is threatened with collapse. There is an urgent, distressing situation today with respect to waste paper consumption. The Waste Material Dealers wish to present the problem to you in the hope that prompt, effective action will be taken.

Nothing in the history of the waste material industry compares with the hardship suffered now and during the past year. Its effect has been such on management as to reflect deeply on labor and so cause its representative to join with us in seeking a solution.

Our problem was taken to the Honorable John J. Rooney, Congressman of New York, who has forwarded to us your correspondence addressed to him dated June 6. We hope that you will arrange for a delegation from the industry representing both management and labor to call so that we may present facts regarding the conditions prevailing today. In the meantime, we submit a program for your consideration comprising the following points: (1) Encourage the use of more waste paper. (2) Institute a program of allocation of wood pulp so our forests will be preserved and wood pulp will not be used to such a great extent when waste paper is available. (3) Convince the ECA that waste paper in the U. S., should be sold to foreign countries under the Marshall Plan instead of getting waste paper from other countries. (4) Abolish the Eastern Conservation Committee set up during the war by some of the waste paper consuming mills to create a supply of waste paper for such activities are not now necessary. (5) Investigation by the proper Federal Government Authorities of the scope of the activities of that committee which should bring to light the cause of the present conditions. (6) Develop the facts as to the extent of the use of children to create a waste paper surplus which is destroying a regular peace-time business operation.

We are appealing to you as the head of the Department of Commerce which is charged with considering problems affecting commerce and business.

The committee acting for the Waste Material Dealers comprises Felix J. Troiano of Troiano & DeFina, Brooklyn, chairman; Samuel Lipman of Lipman Bros. Corp., Brooklyn; Lawrence Giove of the Giove Co., Inc., New York; James Columbo of Jos. Columbo's Sons, Brooklyn; Salvatore Ragone of the Smith Waste Material Corp., Brooklyn, N.Y.; Conrad Lefante for Labor, Waste Material Union, Local 445, AFL, Brooklyn.

Brooklyn, Queens, and New York waste paper packers and dealers on June 13, were informed at a meeting at the offices of the Waste Material Sorters, Trimmers & Handlers Union, AFL Local, Brooklyn, that the Department of Commerce plans to hold a series of conferences with representatives of dealers, industrial users and labor unions concerned with the waste paper trade.

Austria's Paper Industry

WASHINGTON — Austria's paper industry has been helped back on its feet by the seller's market for paper that arose all over the world after the war, says an Austrian official news source here.

"Paper mills are now operating at their fullest capacity with current production figures on a par with those of 1937," said the source. The prewar year, it was pointed out, marked a peak in the Austrian paper industry's output capacity.

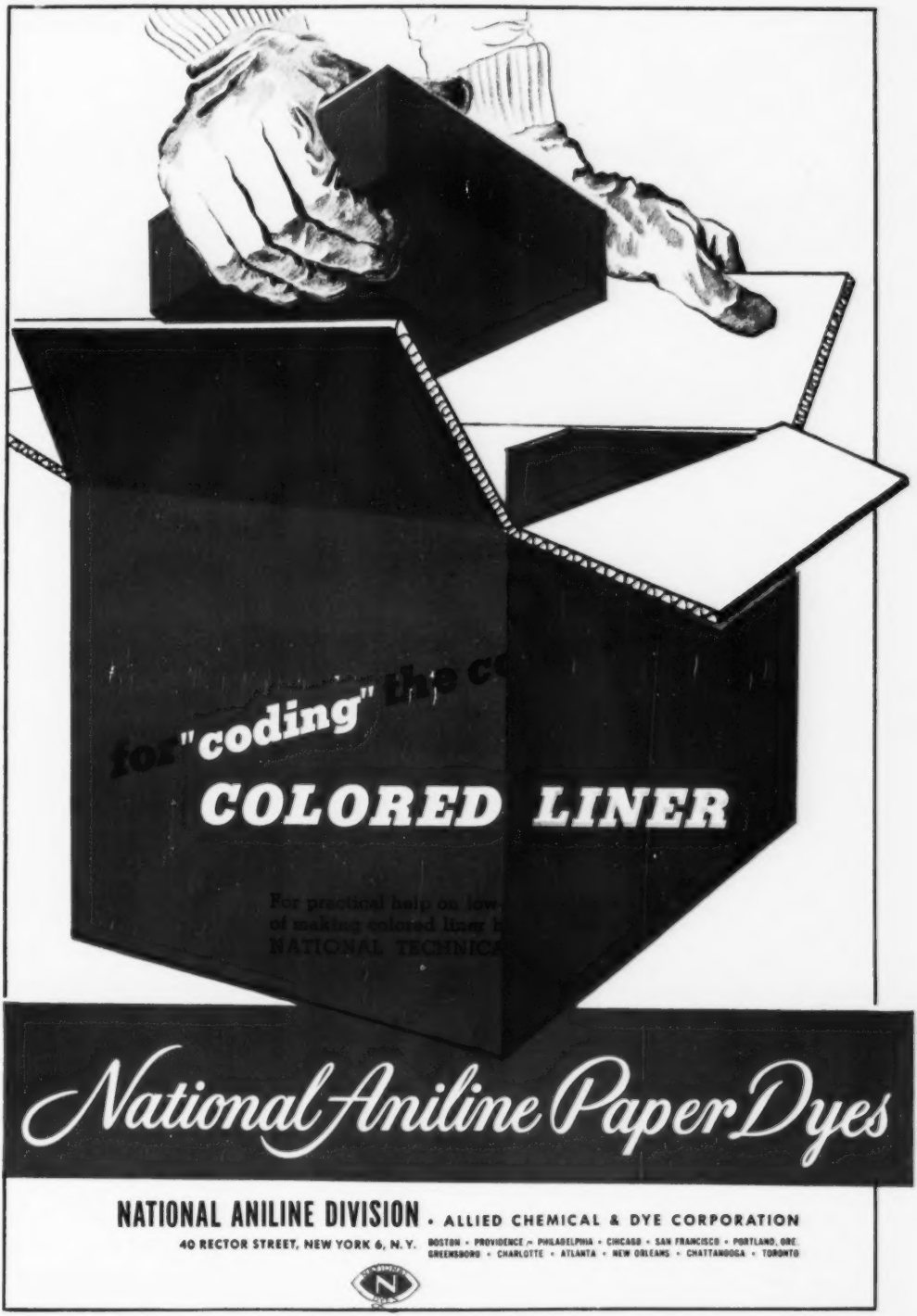
Basis of the industry, it is recalled, is the extensive forest development in Austria, primarily spruce wood. The industry consumes annually 20,000,000 solid cubic feet of timber, at full capacity, and as this is not sufficient for present demand, the industry's greatest concern is said to be for importation of timber from abroad. Such imports are essential to keep the industry operating at full load, it was stated.

Austrian paper exports were said to be currently 12.5 percent of the country's total export trade.

"In view of the orders received to date," it was stated, "the position of the industry can be characterized as extremely favorable, even by comparison with its pre-war situation.

"In the past few months, 65 percent of the industry's output was exported, compared with 55 percent before the war. Last year, the industry succeeded in acquiring new markets all over the world and transactions were concluded not only with traditional clients in the British Empire, Italy, and elsewhere, but also with overseas and Near-eastern buyers.

"The industry was able to work out a satisfactory distribution of all types of paper exported," the statement con-



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tinued. "The average proportion of newsprint amounted to 59 percent; graphic and wood-free paper, 15 percent each, and of wrapping paper, to 10 percent of export orders received."

Austria has an agreement with Bizonal Germany, under which it will purchase urgently-needed new machinery to expand capacity. There are no allocations under ECA for this purpose, it was said. Efforts also are under way to cultivate the Germany market more extensively for the Austrian paper output, to compensate for loss of markets in southeastern Europe.

Canada's Pulp Exports to U. S.

OTTAWA—Exports of pulp to the United States during the first quarter of 1949 from Canada showed the following, with figures for the same shipments in the corresponding period of 1948 being given in brackets:

Unbleached sulphite, 76,356 (114,016) tons, down 33 percent; bleached sulphite, 105,404 (114,507) tons, down 8 percent; unbleached sulphate, 36,150, (38,169) tons, down 5 percent; bleached sulphate, 73,776 (50,617) tons, up 45 percent; groundwood, 42,885 (61,219) tons, down 30 percent; total, 334,571 (378,528) tons, down 12 percent.

This means that Canadian exprots of pulp to U.S. have kept up relatively well in face of the downward trend of U.S. imports since the drop in Canadian exports has not been as sharp as the over-all decline of such American imports in 1949, implying that Canadian pulp exporters have been offering strong competition to suppliers from other countries in the U.S. market.

In addition, the gain in the exports of bleached sulphate to the U.S. during the first quarter of 1949 has been encouraging for Canadian suppliers in view of the extensive expansion in the productive capacity in this country, with bleached sulphate being employed in ever-growing degrees for producing paper products requiring greater body strength, such as paper towels, tissue paper, bag papers, etc.

Connecticut River Navigation Hearing

HARTFORD, Conn.—The State Flood Control and Water Policy Commission held a public hearing June 23 on proposals of the Army Engineers Corps to make the Connecticut River navigable to Holyoke, Mass., a plan endorsed by Holyoke paper manufacturers who see in it an opportunity to have cheaper transportation for raw materials and finished products.

The proposals include building a dam, 45 feet in height, at Windsor Locks, as well as construction of locks and a hydroelectric plant which, in an average year, would produce 247,000,000 kilowatt hours of electricity. The locks will be 56 feet wide, 360 feet long, and have an 18-foot depth. The entire project, including dredging the river and construction of the dam, locks and plant will cost an estimated $31,925,000. This cost, to be paid by the federal government, will be exclusive of any financial loss incurred by the existing power installations at Windsor Locks, Chicopee and Holyoke, the engineers estimate.

The engineers propose to dredge and deepen the existing channel from Long Island Sound to Hartford to a 16-foot depth. It is now 15 feet deep. They propose to dredge a channel 12 feet deep and 100 feet wide from Hartford to the foot of the Enfield Rapids.

The proposed dam would create a pool which will provide navigable waters from the dam to Holyoke, the engineers said.

The proposed dam would be built about three miles downstream from the existing Enfield Dam and would replace the present structure, which would be removed. Annual maintenance and operation costs of the project would be $426,500.

The State or other local interests are asked to hold the federal government free from any claims for damages arising from the project. They are also asked to provide disposal areas for the dredging, reimburse the government if it has to buy land for such disposal areas, or pay the government for the cost of using other than hydraulic dredges in the work.

Canadian Asbestos Operations

OTTAWA — Producers' shipments of asbestos paper stocks in April dropped to 1,602 tons compared with 7,396 tons in April of last year and declined to a total of 12,182 tons in first four months ended April this year as against 24,833 tons a year ago in the corresponding period, the Canadian Government reports, adding that such shipments of other asbestos products in April this year showed the following, with figures for the same month last year in brackets:

Crude, 22 (54) tons; spinning stocks, 437 (2,510); shingle stocks, 2,562 (10,377); waste, stucco or plaster, 1,467 (11,712); refuse or shorts, 9,912 (29,541); total, 16,002 (61,590).

Such shipments in first four months ended April showed the following, with figures for same period last year in brackets: Crude, 149 (282) tons; spinning stocks, 3,716 (9,107); shingle stocks, 15,982 (36,283); waste, stucco or plaster, 17,012 (37,641); refuse or shorts, 53,751 (112,728); total, 102,792 (220,874).

Canadian exports of asbestos products in April included the following, with figures for April, 1948, in brackets: Crude, nil (82) tons; milled fibres, 4,261 (19,214); waste, refuse, shorts, 9,968 (40,182); total, 14,229 (59,478). In the first four months ended April, such exports were as follows, with figures for 1948 in brackets: Crude, 147 (325) tons; milled fibres, 32,346 (67,772); waste, refuse, shorts, 70,753 (141,212); total, 103,246 (209,309).

Trinidad Paper Situation Surveyed

TORONTO—A survey by the Trinidad (B.W.I.) Chamber of Commerce of Canadian, U.S., and U.K., prices and availability of merchandise notes, in discussing paper and paper products, found that: "Under ordinary circumstances imports of wrapping paper come from the U.S. and Canada in substantial quantities. Today a large proportion is being imported from the Continent at appreciably higher prices. Present landed cost of this particular type of paper from Canada is $17.91 per bale of 20 reams as against $27.69 per bale of 20 reams from the Continent—a difference of 55 percent. This substantial difference is maintained in all paper lines, such as ice cream straws, toilet paper, drinking straws, etc."

Reflecting the growing British West Indies disquiet at the present situation, the *Barbadoes Advocate* recently stated, in part: "The Board of Trade (British) has invented a new kind of mathematics which brings in the shekels for the British worker but which does not give full and fair consideration to the West Indian wage-earner. The policy now being followed not only in (West Indies) forced trade with the U.K., but also in the wider sphere of sterling and dollar areas, is full of pitfalls. Canada is rightly squealing while there is time."

Canadian Exports—April

OTTAWA—Exports of newsprint paper from Canada advanced to $32,393,000 during April this year as compared with $29,053,000 in the same month a year ago and increased to a total of $126,420,000 during the first four months of this year as against $113,814,000 during the corresponding period of last year, the Canadian Government announces.

However, this official report discloses that exports of other paper decreased to $1,891,000 during April, 1949, compared with $2,827,000 in the similar period of last year and fell down to a total of only $6,843,000 during the first four months of the year as against $10,361,000 in the same period a year ago. Likewise, exports of books and printed matter from this country declined to $202,000 during April compared with $481,000 a year ago April and dropped to a total of $1,135,000 in the first four months of 1949 as against $1,459,000 last year in the corresponding period.

Exports of woodpulp from Canada slumped down to $12,929,000 in April compared with $18,854,000 in April, of last year and decreased to a total of $59,157,000 in the January-to-April period this year as against $66,954,000 in the same period of a year ago.

Towne, Springfield College Trustee

SPRINGFIELD, Mass. — Richard P. Towne, treasurer of the National Blank Book Co., Holyoke, has been elected to the board of trustees of Springfield College.

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Paul E. Cooper Addresses Western Branch CPPA, Pacific Coast Branch Supts.

VICTORIA, B. C. — Speaking at the joint spring meeting of the Pacific Coast Branch, Technical Section of the Canadian Pulp & Paper Ass'n. and the Pacific Coast Division of the American Pulp & Paper Mill Superintendents Ass'n., at the Empress hotel recently, Paul E. Cooper, chairman of the Western Branch, CPPA, and president of Pacific Mills, Ltd., said in part:

"British Columbia's pulp and paper industry is barely 40 years old. But, paper making got underway in California 93 years ago. In spite of the youth of the industry north of the border we are all "one big family" west of the Rocky Mountains.

"You are all aware of the rapid growth of the industry in British Columbia. During the past ten years our production has more than doubled.

"We export all of our dissolving pulps and practically all our "for sale" sulphite and sulphate pulps and over 90 percent of our newsprint production. Of the 81,000 odd tons of specialty items, almost 95 percent is sold in Canada. Approximately 80 percent of our total tonnage now goes to export markets. The United States takes about 90 percent of this amount, the value of which last year exceeded 50 million dollars.

"The exchange situation has had a decided adverse effect on our ability to supply what were formerly satisfactory and growing overseas markets for wrapping and specialty papers. Furthermore, it is impossible at this time to foresee whether this condition will worsen or improve.

"The first months of 1949 are providing ample evidence of an economic shrinkage. In other words the transition from a seller's market to a buyer's market now appears to be complete.

"The industry therefore can look forward to the immediate future with some degree of speculation. No matter how well integrated, and in spite of efficient management, and careful planning, the industry is always subject to the law of supply and demand. Pulps and papers are particularly sensitive to this maker and breaker of markets.

"There are definite indications that trade and commerce has now entered an era of intensive competition. Therefore, salesmanship is becoming more essential to the operations of manufacturers.

"I believe most of us here assembled share a direct and technical interest in pulp and paper production. So all of us have an important personal stake in the immediate future of the industry. In addition to being exposed to the prospect of varied and stiffer foreign competition, our industry (in fact most industries on this continent) is now caught in the crossfire of increasing costs and decreasing demand for its finished products.

"How shall we meet this triple threat? Generally speaking the answer is: with improved merchandising and intensive selling plus research, improved products and increased plant efficiency.

"At this time I wish to discuss some factors affecting our supplies of raw material; namely, wood.

"Four years ago, the B. C. Provincial Government published the Sloan Commission report. One of the most important recommendations made by this Commission dealt with proposed legislation to revise the British Columbia Forest Act so that the productive forest areas may be managed and maintained on a perpetual yield basis.

"Thus, in 1947, British Columbia's Forest Act was amended. These amendments were intended to provide the first step in the creation of a permanent forest industry in this Province.

"Most authorities will agree the amendments were not perfect legislation. I don't believe they were advanced as such. I do believe the writers and sponsors of the amendments knew very well further revisions would be required from time to time, as subsequent developments made necessary. In this connection it is the consensus that one or two important changes could be made in the statutory provisions so that the Government's over-all plan could work better.

"Two years of study and trial have been given by the Forest service and industry to lay the foundation for the development of a permanent forest industry. Results to date are not inspiring. Washington and Oregon, dealing with precisely the same problem, have both made greater advances. They are far ahead of us. Many engaged in the forest industries of British Columbia are convinced the major advances made in permanent forestry in the United States are due to the rapid development of the Tree Farms Movement.

"The Tree Farms Movement got underway in the State of Washington in 1942, five years prior to the enactment of British Columbia's Sustained Yield Management Legislation. Therefore, Washington and Oregon are at least five years ahead of British Columbia in assuring those states and their people of a perpetual yield of timber and a permanent forest industry.

"Frankly, gentlemen, I believe our forest legislation can be improved by embracing and employing some of the directives and methods that have contributed to the success of this movement in the United States.

"There is a psychological factor which in my opinion has contributed largely to the success of the tree farms movement south of the border. Almost overnight it captured the public imagination.

"Strangely enough, it has been the policy of successive governments of British Columbia, for more than 50 years, largely to retain forest land in the name of the King. These lands are known as "Crown Lands." In general, the Government's policy has been to retain ownership of the land and sell only the timber.

"Many operators in our forest industries consider the land policy of our Provincial Government outdated. Some say it is basically wrong. Many believe the time has arrived when its policy should be revised. At least, insofar as it governs forest lands. They claim outright ownership of forest lands should be permitted on a basis of the true value of the lands as they exist; that forest lands be treated exactly like other crop bearing lands. This, of course, will require revision of our existing land laws to provide for a new classification called "Tree Farms." Under revised ownership conditions anyone could purchase and operate a tree farm, large or small. Outright ownership will stimulate a healthy, creative, and more cooperative interest. This is now being demonstrated throughout the United States from Virginia to Washington.

"It would be inappropriate to conclude these remarks without reference to the expansion presently taking place in the pulp and paper industry in British Columbia. You are all familiar with the details of this 82 million dollars of new plant construction. Without question the individual plans making up this total expenditure were predicated on sound counsel and long term potentials. Nevertheless, a general buyer resistance is presently softening the prices of pulps. It is calculated that this condition may check further expansion of the pulp and paper industry in this Province for an unpredictable period of time. With the sterling countries trading only with sterling we are deprived of many of our pre-war markets. Because buyers in these markets lack dollars, our trading is confined almost exclusively to the dollar areas. We are therefore largely dependent upon the United States market and the continued prosperity of that nation.

"We must also remember a healthy development of the general economy of British Columbia and the Pacific Coast depends a great deal upon a plentiful supply of investment and risk capital. And, as intelligent executives in one of the world's most important industries we should be constantly alert and personally contribute our best to safeguard its lifelines from the control systems of Socialistic theorists and crackpot minority groups. To safeguard our freedom and the security of our homes we must take an increasing interest in our democratic governments. In a democracy we can constructively criticize or commend as becomes necessary. We should do both.

"So much for the present and immediate future. What are the long term prospects?

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and ground wood pulps will undoubtedly exert a growing influence on the general economy of the Pacific Coast. British Columbia, Washington and Oregon share a vast belt of softwood forests. The volume of their growth per acre far exceeds that of other wood producing areas in the world. It is fitting that a land so richly endowed should also possess a generous share of the best practical and technical brains in the pulp and paper industry. With these essentials, plus the cooperation of labor, plus intelligent salesmanship, we shall meet our marketing problems and manufacture pulp and paper products of constantly improved quality. The industry's future is largely in your hands."

Production of Photographic Paper in Japan

WASHINGTON—Prior to 1936, Germany supplied most of the photographic paper used in Japan. In that year, the Mitsubishi Paper Manufacturing Company purchased a 78-inch Fourdrinier paper machine from the Voith Company in Germany and installed it at their Nakagawa mill in Tokyo. The following year Mitsubishi installed a 75-inch machine at their Takesago mill near Kobe. This machine is a Japanese copy of the German Voith machine, except that it has a four-cylinder wet end section instead of a Fourdrinier section, in order to facilitate production of the heavier photographic paper which weighs 250 grams[1] per square centimeter[2]. These machines were designed specifically for the production of photographic paper and were found satisfactory by the Japanese. Without them Japan would have had difficulty in meeting its photographic paper demands during World War II.

The Fourdrinier section, four-cylinder section, the four press sections, and the first four driers are constructed entirely from bronze. The remaining 12 driers are cast iron. No suction couch roll is used. The first and second press rolls rotate in the sheet direction, the third section of the press is reversed, while the fourth section rotates in the sheet direction. Each drier has its own separate felt. Two stacks of smoothing rolls are located between the drier sections. The machine has two calendar stacks with six and eight rolls respectively in the stacks. The air in the machine room is changed every 20 minutes by filtering through glass wool and felt filters. The beater room is likewise supplied with filtered air to prevent contamination with dirt. All doorways have a hallway to keep dirt away from the machine room. The air is heated during the winter season. There are three 500-pound beaters for each machine, and the stack passes through four Erkensaters and then a rotary screen. Four centrifugal cleaners remove dirt before the pulp suspension reaches the machine. All pumps and pipes in the system are made of copper.

Purified rayon-grade wood pulp is used as the raw material. It is bleached in rotary digesters with bleaching powder solution, then washed well and passed through four Erkensaters before being added to the beaters. The tackle in the beaters is made from stainless steel. Beating time is two hours, during which the fibers are cut short, but hydration is avoided as much as possible. Just before the expiration of the two-hour period, three pounds of formaldehyde solution and three pounds of animal glue dissolved in water are added to each beater. Nine pounds of hydrogenated whale oil soap then are added uniformly to the beater stock, followed by 15 pounds of alum. No barytes is added to the beater. The paper machine operates at about 50-70 feet per minute, and precision in production is apparent from observing the operators and the machine.

The base paper leaves the paper machine in rolls 40 inches wide and is made in three weights—150, 200, and 250 grams per square centimeter. For better quality, this base paper is coated with a barytes coating, using casein as an adhesive. Barytes is made in the paper mill by precipitation of barium chloride and Glauber's salt. The coated paper is supercalendered on a Holyoke Machine Company unit using four steel rolls and four paper rolls. This unit is 68 inches wide, can operate at a top speed of 200 feet per minute, and can be slowed down by electrical speed control to a rate of 30 feet per minute to facilitate start-up operation.

The two photographic paper machines have a combined capacity of 280,000 pounds monthly. At present these machines are operating at 50 percent of capacity, the machine at Takesage making only the 250-gram weight and the Nakagawa machine producing the other two weights exclusively. The base paper sells today at Y107 1/a pound, and the coated paper at Y100 a pound.

Today the photographic paper situation in Japan is changing. Japan, which imported photographic papers before World War II, now is searching for export markets. Mitsubishi, the only photographic paper-producing company in Japan, is conservative and is proceeding with caution in shipping its product into warmer climates. It has had no experience as to the stability of its product in humid, warm localities. Tests are underway to determine the stability of the product, and small-scale trial shipments have already been made. Japan's export possibilities in this community appear to be good.

[1] 1 gram equals 0.035 ounce (avoirdupois).
[2] 1 centimeter equals 0.394 inch.

[3] The 1949 rate for the yen, until April 24, 1949, was the military rate of 270 yen per United States dollar; as of April 25, 1949, a new commercial rate was established at 360 yen to the United States dollar.

Source: Weekly Summary, Natural Resources Section, General Headquarters, Supreme Commander for the Allied Powers, Tokyo, Japan.

Vt. Governor Asks FPC Resignations

HOLYOKE, Mass. — Gov. Ernest W. Gibson of Vermont on June 12 went on record in favor of the St. Lawrence River development, cheaper electricity for New England, and the resignation of two Federal Power Commission officials whom he charged "no longer represent the people of New England nor the people of the United States." The governor addressed a banquet of approximately 80 members of the New England Association of Electric Cooperatives and the New York State Cooperatives at the Roger Smith hotel.

In his talk, Gov. Gibson attacked both Nelson Lee Smith, chairman of the FPC, and Willard Gatchell, its assistant general counsel. In the Holyoke case, he said, the FPC representatives "failed to represent the people." The Holyoke paper mills had opposed the public project, favoring, instead, the victorious Holyoke Water Power Co., a private utility which represented the mills' century-old indentured rights to water power on the three-level canal system, which the G & E had planned to scrap, with resulting heavy loss to the mills.

But in joining with the paper manufacturers on the St. Lawrence River development, the Vermont chief executive said he would "fight to the end" for its success, telling delegates to the meeting that the future of New England industries depends upon the development of more electric power and its sale at cheaper rates.

New England's Water Power Resources

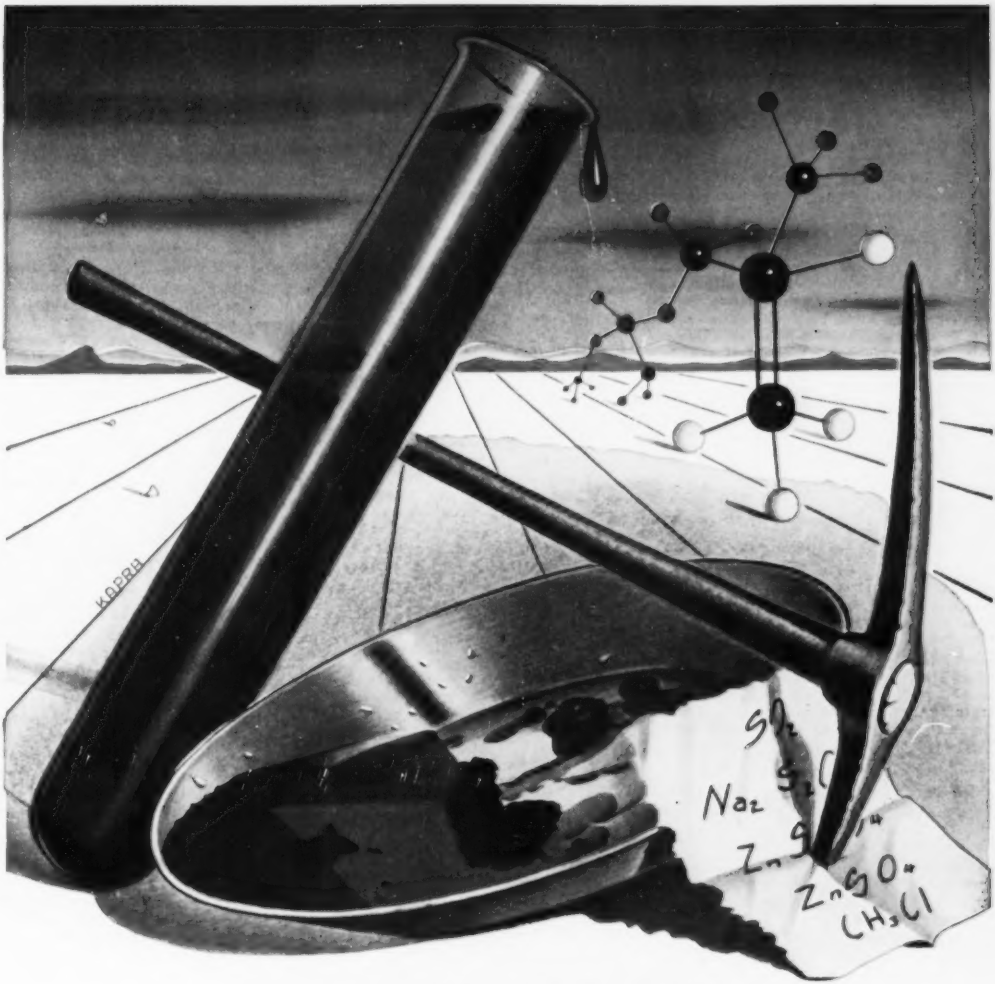
MANCHESTER, Vt. — New England, except for Maine, compares favorably with the rest of the country in the development of its water power resources, Howard M. Turner, consulting engineer and professor of the practice of civil engineering at Harvard University, declared on June 10 at the 95th quarterly meeting of the New England Council here.

Mr. Turner pointed out that obviously some of the mills that moved south were not driven out because of high power cost since they left their cheap water power behind. "When it is said that the cost of power in New England is high, no consideration is apparently given to the low cost water power now obtained by mills owning their own water powers, by the . . . paper companies at Holyoke and on the large rivers in Maine," Mr. Turner said.

U. S. Exports and Imports

WASHINGTON — Exports of paper and paper manufactures from the U.S. in April rose to $9,500,000 from the March total of $9,300,000, preliminary figures of the Commerce Department disclose.

Newsprint imports declined somewhat, 726,000,000 pounds in April, from 785,000,000 pounds the preceding month. Woodpulp imports also dropped in April, 98,000 tons compared with 127,000 in March.



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You Can Cure Turnover

By H. H. WILLYOUNG
Director, Associate Membership
Research Institute of America, Inc.

Editor's note: Companies that have kept careful estimates report that their employe turnover costs run from ten dollars to over $200 per individual. The following article tells you what steps you can take at the supervisory level to reduce turnover. It is reprinted by permission of the Associate Membership Division, Research Institute of America, Inc., 292 Madison avenue, New York, and is based on supervisory material which the Institute prepared for member companies and their supervisors. Among paper companies taking part in the Associate Membership are Clifton Paper Board, Crown Zellerbach, Florida Pulp & Paper and Union Bag & Paper Corp.

Turnover is a peculiar disease. The veteran employe is relatively immune; it's the newcomer who is highly susceptible. In fact it is not unusual to find 75 percent of all turnover centering on employes who have been with the company less than six months.

Unfortunately, supervisors and foremen—the people who have the greatest influence with new employes—are inclined to think of high employe turnover as a problem to be solved by the personnel department. The individual whose department is being constantly upset by departures and arrivals, and who has the continuing headache of training new people, is apt to figure that the employment department is falling down on the job of recruiting, screening or replacement.

In some cases, of course, this may be the right explanation; in others it may be partially true. But often the shoe is on the other foot. A great deal of turnover is the direct result of improper induction and follow-up by the supervisor. Unless he picks up where the personnel department leaves off, the separation rate in the early months of employment can be startingly high.

Attack at the Supervisory Level

If you want to lower your turnover costs, the logical place to start is with your supervisors and foremen. One method is to provide them with a written guide including checklists based on the company's policies. "You Can Cure Turnover," the booklet which the institute prepared for supervisors and foremen enrolled as associate members, contained the following checklists, all of which can be modified to meet your own requirements:

(1) *Before requisitioning*—Can vacancy be filled by promotion? If not, is more training needed? Does vacany offer opportunity for transfer? Is workforce sold on the need for an outsider? Has the job been made as attractive as possible? Is personnel supplied with a good picture of the person you need?

(2) *When interviewing*—How long has applicant held similar jobs? Have his references been checked? Has he a clear picture of the job's advantages? Discounts? Vacations? Bonus? . . . Has he a clear picture of its disadvantages? Should the job content be changed? Can changes be sold to others concerned?

(3) *After job is accepted*—Has new employe necessary preliminary information? When and where to report? Suggested dress? Where and how he will be paid? Where he'll eat? Parking lot locations? . . . Is the workgroup prepared? Do they know he's coming? Are they familiar with his qualifications? Has *their* co-operation been secured?

(4) *Before the new employe reports*—Have you made room for him on your schedule? Is his workplace ready? Location Okay? Supplies? A fellow-employe assigned as sponsor? His first day's work laid out?

(5) *First day induction*—Has the new employe been welcomed? Desk, etc., assigned? Immediate questions off his chest? Pay procedure reviewed? Tour of department been made? Layout explained? Rules and customs? Introductions made? Work assignment? . . . Written informational material issued? Department floor plan or roster provided? Employe turned over to sponsor? End of day interview with supervisor?

(6) *First week induction*—(a) Information: Has new employe read employe's handbook? Does he understand rules and regulations? Does he understand necessary procedures? Vacation policy, bonus plans? How his pay is computed? Basis of pay increases? Promotion opportunities? Suggestion system? (b) Performance: Does he understand standards? Have you recognized his good points? Made necessary corrections? Highlighted his progress? Given him objectives? Importance of job? Departmental goal? Company goal? Has he self-confidence? (c) Adjustment: Teamwork stressed? Any friction? Extra efforts by other members of the group acknowledged? Does he know about departmental off-the-job activities? Company paper utilized? End of week interview: With sponsor or assistant? With new employe?

Approach to Permanency

Usually we think of induction as a process of relatively short duration. Actually it exists until the new employe has become an old-timer in his eyes as well as the workgroup's. This means that the supervisor must make regular and thorough-going check-ups long after the first week—that he must continue to be on the watch for such symptoms as loss of interest; a defeatist attitude; failure to grasp instructions; low initiative; lack of responsibility; poor teamwork and gripes.

Another danger point is absence of suggestions. The new employe who steadfastly withholds voluntary contributions may be deliberately avoiding anything that helps the other fellow out—or he may simply be convinced that his contribution isn't worth the effort. There is always the possibility, too, that the supervisor himself is failing to invite his co-operation.

A final checklist based on these various points will help the supervisor determine when the end of the probationary period has been successfully reached.

Call a Supervisory Meeting

While you yourself can adapt these various checklists to company requirements, you will get better results if the final versions are worked out by your supervisory staff at a group meeting. Plan your meeting to bring out four major points: (1) High turnover is a major cost factor. (2) Faulty induction is usually at the root of the problem. (3) Induction can reduce turnover when it is handled as a joint responsibility of the supervisor and the personnel department—with most of the burden on the supervisor. (4) Successful induction must be systematic—built around checklists tailor-made to the company's requirements.

Line and Staff

The logical person, of course, to present turnover costs to the group is a representative of your personnel department, carefully briefed in advance. In introducing him, however, be sure that your front-line managers understand that the personnel department represents a *staff* function; supervisors, a *line* function. Preventing turnover is the supervisor's job—as a member of line management. It's the personnel department's function to provide the supervisor with whatever knowledge and skill he requires to do the job. Line people have a great tendency to let staff people carry the responsibility. Since this results in a dangerous distortion of the normal functional relationship of line and staff, any opportunity you can find to point out the basic fallacies is all to the good.

Figures—Not Platitudes

If you are to get the basic ideas across to your front-line management, you will have to build your meeting on a firm foundation of the facts as they apply to your company, and not on generalities about turnover. These are the figures your personnel representative will have to supply: (1) *Annual rate of employe turnover* (Most easily figured by dividing the total number of separations a year by the average number of persons on the payroll in that year. The average payroll figure can be obtained by adding the mid-monthly figures and dividing by 12.) (2) *Costs of employe turnover* for recruiting, hiring, placing, equipping, training and terminating.

Hidden Cost Factors

Your turnover costs, of course, are actually higher than these figures indicate since the figures include only the

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easily measured factors. Have your personnel executive list a few of the hidden cost factors on a blackboard—loss of individual production; decrease of team production; loss due to bad community and public relations. If you have time, let your supervisors themselves dig out a few of the hidden cost factors. Simply throw open the floor for discussion by asking, "What other loss factors are caused by high employe turnover?"

Where Turnover is Highest

You can illustrate the structure of your turnover problem with a simple diagram drawn on the blackboard. Chalk a large box to represent the group of employes among whom there is almost no turnover—the 90 percent, the *old-timers*—who account for only ten percent of your turnover. Alongside it, chalk a small box to represent the employe group in which the turnover rate is highest—the group that has been with the company *six months or less*, and which accounts for 90 percent of the turnover.

You will want to make sure that every member of the group understands the significance of these figures. After the personnel representative has diagrammed and explained them, ask these questions: (1) How do these figures stack up with those in your department? (2) How many of your old employes have left in the last year? (3) How do you think the chart would look for your department? (4) Have you ever made this calculation for your department?

Checklists

The rest of the conference is devoted to developing checklists that will help your supervisors do a better induction job and which are essential equipment if they are to follow systematically a step-by-step procedure for each new person.

The lists already provided in this article give you an outline of the points to be covered. The supervisors themselves should develop these outlines into a more detailed worksheet that meets company needs. Ask such questions as "How can we schedule the new employe's arrival so that nothing can interfere with our giving him a good welcome?" And "What questions would he like to have answered immediately?" Use the blackboard to record the group's recommendations.

Summarize Group Findings

At the end of the conference, summarize what the group has worked out, explaining that their recommendations will be drawn up as a tentative company checklist, that each member of the group will receive a copy and that all members of management will be expected to make additional suggestions and recommendations with the changes to be discussed, accepted or rejected at the next session.

Explain, too, that the results of the second session will then be submitted to top management for approval and that, once approved, the lists will become the company's official induction procedure.

Final Point

There is a final point you will want to re-emphasize in conclusion: An employe has not been inducted by the end of a week. Induction, and the supervisor's induction responsibilities, last right up to the time the new employe becomes an old-timer. And during those first critical six months it's up to the supervisor to inoculate his new people against the turnover germ by giving them clear-cut objectives, the feeling that they are wanted, and a sense of permanency.

Favors Waste Disposal Investigation

BOSTON — Arthur D. Weston, chief engineer of the State Department of Public Health, on June 14 went on record in favor of an investigation of the disposal of sewage and industrial wastes in the Housatonic River Valley in Hinsdale, Dalton, Lee and Pittsfield —location of several paper manufacturing mills. The investigation, to be made by the Public Health Department, is asked by Senator Michael H. Condron (D-Pittsfield). It provides that findings and recommendations for legislation, if any, shall be filed in the Senate by December 1.

Mr. Weston told the House Ways and Means Committee, which heard the bill, that the main purpose is to guide municipalities in the valley in waste disposal. The town of Dalton, he said, has already made plans for disposal of waste, but no provision has been made for linking this project up with Pittsfield. The chief engineer estimated the cost of the proposed investigation at $7,000. He said the resolve did not establish a precedent, since similar studies had been made in various parts of the state, and as conditions have changed, renewed studies have been made.

Puget Sound P. & L. Service Upped

WASHINGTON—The Federal Power Commission has approved additional permanent interconnections for emergency use on the electric transmission system of the Puget Sound Power & Light Co. in the State of Washington.

The FPC order, which authorizes Puget Sound to maintain the additional connections without thereby becoming subject to FPC jurisdiction, approves interconnections with Bonneville Power Administration's Olympia and Snohomish substations. The Commission, however, denied the company's request for blanket approval of any additional interconections it "may make to alleviate the power shortage."

The company in 1947 was authorized by FPC to maintain certain wartime interconnections with other electric utilities serving the Pacific Northwest. Last month, Puget Sound, stating that the power shortage has become "progressively worse," filed the new application requesting approval of additional interconnections which have been installed since 1947.

The company, which has main offices in Seattle, sells electricity at retail and wholesale in central and western Washington.

British West Indies Paper Market

OTTAWA—There are louder whispers here now indicating that trade circles would like to see the British West Indies market opened up to a far greater extent to Canadian goods than at present, though the British Government has insisted that BWI should concentrate on purchasing needed supplies in sterling rather than in so-called "hard" currency, dollar, countries like Canada or U.S., with a survey by the Trinidad Chamber of Commerce stating the following in regard to paper and paper products:

"Under ordinary circumstances, imports of wrapping paper come from the U. S. and Canada in substantial quantities. Today a large proportion is being imported from the continent at appreciably higher prices. Present landed cost of this particular type of paper from Canada is $17.91 per bale of 20 reams as against $27.69 from the continent, a difference of 55 percent. This substantial difference is maintained in all paper lines, such as ice cream straws, toilet paper, drinking straws, etc."

Picnic for Pulp Suppliers

SPRING GROVE, Pa. — The Glatfelter Pulp Wood Co., a subsidiary of the P. H. Glatfelter Co., held its annual picnic for its suppliers of pulp wood at the Glateo lodge in the Pigeon Hills on June 21.

The affair drew wood suppliers and their families from a half dozen counties of Pennsylvania and sections of Maryland.

Included on the program for the suppliers and their families was a tour of the Glatfelter paper plant.

Four New Packaging Series Manuals

NEW YORK—Four new manuals in its Packaging Series (No's. 25-26-27-28) are now being offered at 75 cents per copy by the American Management Ass'n., 330 West 42nd street. The booklets are titled, respectively: "Cost Controls for Packing, Shipping and Warehousing", "A Primer on Basic Types of Shipping Containers and Interior Packing Pieces" (illustrated), "Consumer Packaging—Its Technique and Psychology", and "Specifications for Package Materials and Design" (illustrated).

Newfoundland Woodpulp Exports

OTTAWA — Woodpulp exports from Newfoundland in the fiscal year 1947-1948 totaled 42,885 tons of unbleached sulphite valued at $2,996,198 and 778 tons of mechanical valued at $47,916.

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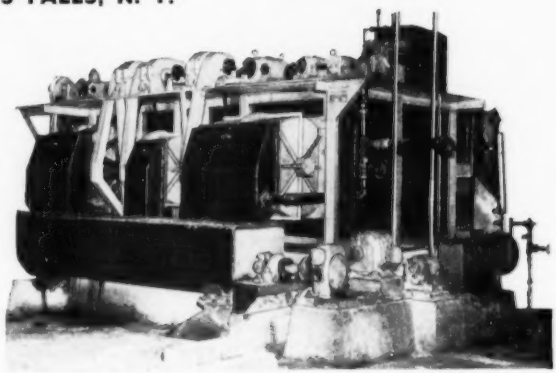
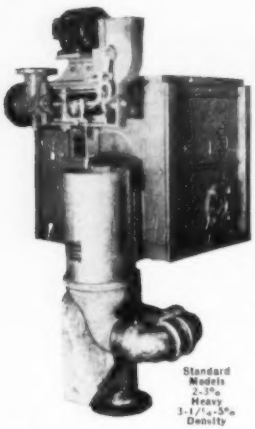
The rate of total output of the System can be adjusted instantly over a wide range without disturbing relative proportions of any of the ingredients. Without shutting down, proportions of any, or all, pulps or chemical ingredients can be individually changed to meet your requirements.



Totalizing counters record the volumes of each pulp used during any given period, for cost accounting purposes. Specific designs are available to meet your individual mill requirements. These range from 10 to 400 tons per day for two or more Pulps, Color, Size, Clay Alum, etc.



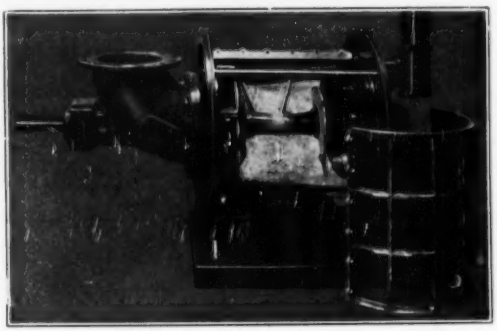
TRIMBEY CONSISTENCY REGULATORS
Centrifugal Pump Type

TYPICAL CAPACITIES PER 24 HOURS USING 30-37 H.P. 420-475 R.P.M.

	PERF.	TONS
Sulphite	.055"	20-30
Ground Wood	.065"	30-35
Mixed Waste Papers	.110"	50
De-Inked Book Stock	.055"	50
Semi-Chemical Pulp	.045"	50
Soda	.050"	75
Kraft	.090"	50-70
Insulating Board	3/16"	50

These regulators automatically control pulp at densities from 2 to 5%, allowing a *maximum* variation of 1/10 of 1% consistency, plus or minus. They are sensitive to changes of consistency of 2/100 of 1%. The regulating action is automatic, independent of the tonnage handled. The Regulator is suitable for use with centrifugal pumps. The basic principle is a change in the friction head corresponding with changing consistencies, controllng the amount of thinning water added at the suction side of the pump. This engages a fork-and-ratchet mechanism controlling a water-driven water valve. Special "Mixing Box" Type Consistency Regulators are available for use with either Centrifual or Plunger Pumps.

For consistencies from 2 to 3¼%, the friction cylinder is 8" in diameter, with a 2½ or 3" outlet, requiring a supply of 35 gallons per minute. For consistencies from 3¼ to 5%, a "Heavy Density" design with a friction cylinder 10" in diameter and a 4" outlet is used, requiring a supply of 75 gallons per minute.



TRIMBEY CONTRIFUGAL PULP SCREEN

Screening at HIGH CONSISTENCIES is allowed by this completely submerged type of Centrifugal Pulp Screen. It delivers the accepted stock at a point 2 feet above the center line of the screen. The rejects, which run from 5 to 12%, are raised 3 to 5 feet above the center line of the screen, permitting the Tailings Screens to be located at the same height as the Primary Screens and to be fed automatically without pumping.

The pulsating action of the screen automatically cleans the plates WITHOUT SHOWERS.

The large clearance and self-cleaning action reduce plate breakage and deliver CLEAN stock.

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Basic Issues in Chipper Design

By
CHARLES R. WARDWELL
Carthage Machine Co., Carthage, N. Y.

Some years ago a pulp mill near Sunsvall, Sweden, made tests to compare a ten-knife chipper with their four-knife chippers. In 27 cooks, spaced within their regular schedule, they analyzed all phases of chip production and cooking. They announced savings of 1½ percent on wood costs through reduction of fines, and stated that digesters had ten percent higher production due to better packing of the uniform chips. Throughout the world papermakers have announced tests pointing to other savings resulting from the multiknife chipper, and one gentleman well known to most of us computes it as $1.31 per ton of pulp better than the four-knife chipper. Figures like these are familiar to most of us and they are the basis for a thing most accept as fact—namely that the multiknife chipper is a vastly improved machine over its four knife predecessor.

What Is a Multiknife Chipper?

Comparatively few people have explored the reasons why the multiknife chipper is a success. Few realize precisely what a multiknife chipper is, beyond the fact that it has many knives, and few realize the principles on which it is based.

The principle characteristics that makes the multiknife chipper good is its ability to stabilize logs in the spout. By achieving this, the machine makes an approach to controlled chipping wherein each knife takes a measured and regulated slice off the end of the log. That is why it is an improvement over the hit-or-miss situation in the old chipper where logs are constantly bouncing and recoiling in the spout. To be sure, the high production of a multiknife chipper is of great importance, but high production is not the reason the chipper was invented. The use of ten knives on its disc was merely a device for stabilizing logs, just as other devices had been invented for this purpose in the past. The objective is and was to make uniform chips.

Getting Most Out of Principle

The multiknife chipper has proven its superiority over the four-knife machine and I have outlined briefly the characteristics which makes it good, namely its ability to hold logs quiet in the spout. Let us now explore some of the design features which equip this chipper to take advantage of its birthright.

Knife Proximity

From the point of view of chip quality, the effectiveness of a multiknife chipper can usually be expressed by the smallest stick in which it can have two knives cutting at the same time. This is the device the chipper uses to stabilize logs. For a given chipper then, the great engineering problem is how to get the knives close enough together so the smallest possible stick will receive two simultaneous cuts. One way is to increasing the number of knives on the disc, and that is exactly what was done in increasing the knives from four to ten. Another approach is to locate the knives close to the hug of the machine where a given number of knives will be much closer together than if they were located out near the perimeter.

Chippers with four and six knives are still being built and some ten knife chippers are built with the knives located out in the perimeter of the disc. This permits higher production than could be hoped for in four knife machines but a relatively large stick must be in the spout before continuous knife pressure can be enjoyed. A small number of knives, or, location of the knife path away from the shaft, are therefore two handicaps to avoid.

Control of Cutting Area

For any multiknife chipper it would be possible to establish a minimum stick in which two knives could cut simultaneously. It would be found however, that whereas two-knife cutting might take place near the hub of the disc where the knives are close together, the same stick would be too small for two-knife cutting toward the perimeter. An advantage can therefore be had by keeping the log at the area of optimum cutting, i.e., the area close to the hub of the disc. There are various treatments of this problem and some designs permit the cutting to take place all over the disc. The chipper with which I am associated employs two devices to keep the logs close to the hub. It orients each knife 4½ inches back of the radius so that the knife tends to push the log to the hub as it crosses the spout. The spout itself has a sloping floor to make logs roll to the inside positon as they slide to the disc.

Knife Mountings

There are two principal methods of placing knives on a chipper disc. In one method the knife is mounted in a holder or slot so that the back of the knife is extended either partly or completely through the disc on a 45° angle. An earlier, though still used, method is to mount the knife more or less flat on the face of the disc where it is held in place by bolts countersunk in the face.

The first method mentioned had advantages which make it far more commonly used than the latter. Its best fea-

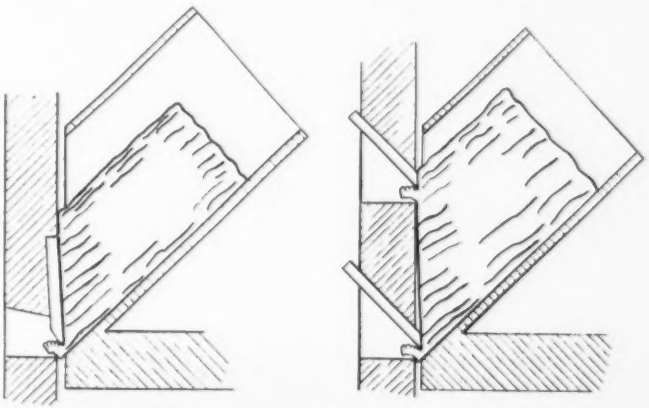
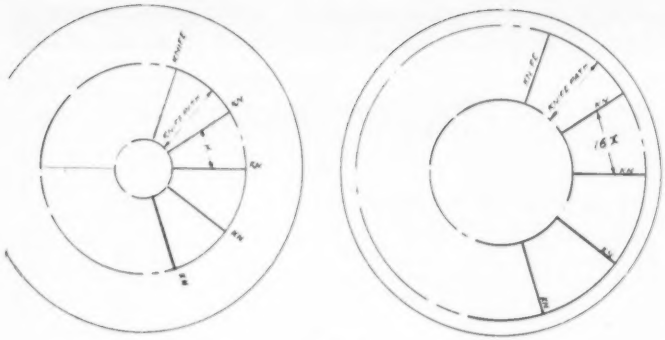


Figure 1

Presented at the American Pulp & Paper Mill Superintendent's Ass'n., annual meeting, Atlantic City, June 15-18, 1949.



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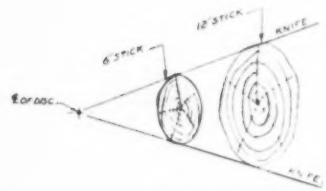

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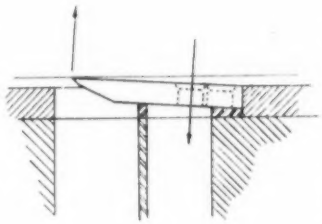

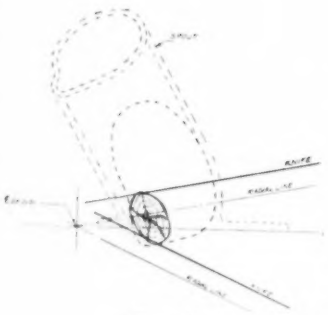

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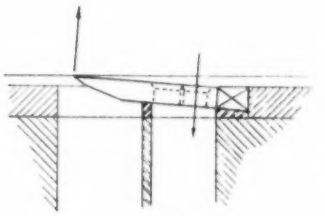

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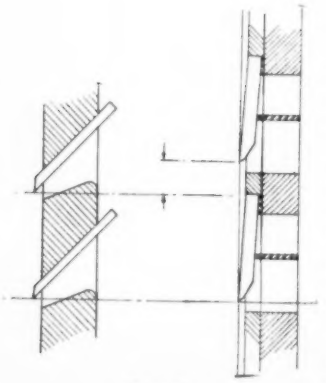

Figure 5

ture is that it uses up relatively little space on the face of the disc and thus permits location of the knives close to the hub where they are close together. It is this characteristic which prompted that design in the first place, and it is a factor which far outweighs all considerations concerning knife life, etc. It has an enormous effect on chip quality.

Other advantages are concerned with knife costs. It is convenient to build more relief back of the knife with this method and thus heat caused by friction on the back of the knife is reduced. Another advantage is that microscopic cracks developing in the cutting edge can work back into the knife only about an inch before stopping at the bevel, and these cracks are removed at each grinding. Still another advantage is that the knife can be better supported near the cutting edge and this gives an improvement in knife life through reduction in vibration or fluttering. The principal disadvantage of this method is that a knife holder is relatively more expensive than a simple bolting arrangement.

The flat mounted knife as used on four-knife chippers years ago is still in use today on some chippers and it is a lower-cost device than knife holders. Its great disadvantage is that each knife covers so much area on the face of the disc that knives cannot be located close to the hub. It therefore forces on the chipper from the start the characteristic of being unable to effect continuous knife pressure on a small stick. It also has limitations on the life of the knife. A fault developing in the cutting edge can and does work all the way back to the heel of the knife. Such a fault will manifest itself in relatively fast nicking of the cutting edge and rapid loss on the knife grinder. There is also an inherent weakness in the knife fastening. As the edge is ground back in sharpening, the clamping bolts come closer to the heel of the knife and the forces set up in cutting work against the knife on an increasingly unfavorable lever arm. This situation promotes fluttering.

Chipping Cat Faces

In cutting extremely abrasive material, such as cat faces found in the south, cutting edges become dull very rapidly on all chippers. In using the multiknife or screw-feed type of chipper, it is necessary to change the knives very often on this kind of material. The cutting edges undergo breakdown as soon as the screw-feed principle ceases to operate and the log rides on the dull bevels of the knives without being cut. By way of contrast, a chipper with the knives spaced wide apart near the perimeter of the disc, will continue to cut after the knives are dull, because the log is riding on the face of the disc or recoiling between cuts instead of being in steady contact with the knives. This does not mean that the knives remain sharp any longer, but merely that they continue to smash through the wood longer after they are dull. Request for a chipper with this quality sometimes originates from the standpoint of better service on cat faces. From our experience it is unwise design. Though able to chip cat faces longer between knife changes, the knives are not sharp any longer and are thus not performing well any longer. Sacrifice of the other features discussed earlier make it undesirable in the final analysis.

Summary

In summarizing, it would be well to point out that the true multiknife chipper is one which has two knives cutting simultaneously on most wood. When this is happening the chipper resembles a screw feed machine. The old four-knife chipper and some modern chippers with knives located near the perimeter of the disc are basically not multiknife chippers because they have limited ability to stabilize logs in the spout. In final analysis, therefore, a modern chipper is best evaluated by the degree to which it capitalizes on the multiknife principle.

Care and Use of Chipper Knives

By

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A Chipper Knife is one of the most abused of all cutting tools, expected to cut good chips from most any species of wood (green or dust dry), frequently containing nails, spikes, barbed wire, conveyor chain, horseshoes, and now and then a piece of shafting or railroad iron.

All pulp mills are interested in cutting the most wood in the shortest time with the least variation in the length of the chip, with no bruising and the least sawdust possible. This can only be done with knives that are properly sharpened and correctly adjusted in a well maintained chipper.

There are a number of reasons why chipper knives do not always give the best results. The most important of these is improper *grinding.*

This being true, your chipper operation is *no better* than the knives you use, and they are *no better* than your grinding.

It should be recognized that the best knives in use today, made of the finest possible alloy steel and with proper heat treating, can easily be spoiled in a few seconds at the grinder. You would be surprised if you had the opportunity to visit all the plants in this country and see how few really stress the importance of good grinding.

The responsibility for good grinding rests on more than one pair of shoulders. First, management must do its share by providing knife grinding equipment capable of doing the work necessary. The type or make depends somewhat on the particular plant, how many knives are to be ground a day and what other type of knives are to be ground or could be ground on the same machine, such as paper knives, slitter knives, stop cutters or doctor blades.

Second, the Superintendent has his part in making sure the machine is well set up and provided with the necessary accessories, such as wheel dresser, protractor, steel rule, etc.

Personnel Selection

To provide the proper personnel to do this specialized job of sharpening knives which is so important to the efficiency of the wood room, the man selected should be capable of being taught how to grind properly. He should not be just anyone who happens to be on hand, as is true in so many cases. Supervision also has another duty and that is to find the proper grinding wheel specification, insist on its being used and not changed every few wheels (as is quite often done) to cut down on the cost of the wheels. This wheel economy increases the cost of the knives considerably by cutting down their life and results in a wood loss at the chipper amounting to thousands of dollars, due to sawdust and bruised chips.

Types of Grinders

There are two types of knife grinders:

A. The knife is held on a knife bar attached to a table which slides on ways back and forth in front of the grinding wheel. This is either direct or belt driven from an electric motor which forms part of the head of the machine and remains stationary.

B. The other type consists of a table and knife bar which are stationary; the abrasive wheel motor and head are set on ways and slide horizontally by the knife. We can also divide these into three classes by weight, as follows:

Light Weight: Not suitable for knife grinding.

Medium Weight: There are several grinders manufactured in this price class, around $3,000. They can be set up to do fairly good work in a small plant where there is not too much grinding. Ways are not covered or protected on these machines and splash guards are generally not provided. If care is not taken to add these necessary accessories the abrasive grain flies onto the ways and soon has them worn out of line, requiring planing and re-scraping of the ways to bring the machine back to first class condition again.

Heavy Weight: "The "A" type of the heavy weight class is represented in the paper mills by the Bridgeport Grinder and manufactured by Bridgeport Safety Emery Wheel Co., at Bridgeport, Connecticut. This machine is being used in many of the new mills of the South. It is well built, is of heavy design; 26″ chuck segments with a 3″ face and 8″ deep; coolant tanks up to 300 gallons; 750 rpm; 25 to 40 hp electric motor with belt drive to the grinding wheel; built with either mechanical or hydraulic rack feed. I prefer the hydraulic type of feed, as it allows the operator to vary the speed of his table as necessary. Splash guards are included in the design, and the ways are protected by guards. I have seen machines of this type over 20 years old and in good condition; one of the best of the "A" type.

The "B" type is represented in the paper mills by the new AK Type, manufactured by Hanchett Manufacturing Co., Big Rapids, Michigan. Weight is about 6 tons; comes in various sizes from 84″ to 170″; 7½ hp electric motor; segment type wheel 16″ × 1¼″ face × 4″; 1150 — 1200 rpm; requires less floor space, due to design; can be bought with hydraulic travel if desired. Ways are well protected by belts. This is recognized as the best grinder in the "B" type field.

The length of machine to be bought depends on many factors. For Chipper Knife grinding only, a knife bar long enough to hold a half set or 5 knives at a time is advisable. This will help hold the balance of knives on chipper. This would normally make the machine not over 150″ long. Beyond this length, we have found the abrasive wheel in grinding high carbon - high chrome wears or breaks away faster than the steel, making feed from both ends and in the middle of the machine necessary.

If it is desired to decrease the time in grinding, we would recommend an electro - magnet chuck which can be bought for most any grinder, saving a great deal of time in bolting on and unbolting knives from the knife bar. These are generally used by all the knife manufacturers and are also used in quite a few pulp mills.

Knife bars and tables should be designed heavy to avoid distortion. A rigid table, knife bar and base are vitally necessary. Green castings should not be used in the manufacture of any grinding machine. Knife bars may be trued up or faced by grinding. It is necessary to set the knife bar face vertical and straighten the wheel up so it will just grind on both edges. A very light cut should be taken and a proper wheel for grinding cast iron should be used. If you have this job to do, watch for the wheel loading and heating the bar, which can distort it worse than when you started. Coolant should not be used on cast iron.

Segmental grinding chucks are a good investment. Segments are cheaper than solid wheels, grind cooler, keep cleaner and generally grind faster.

Coolants for Grinding

Water is one of the best coolants that can be used, due to its properties of transferring heat from the steel to itself, but water also causes rust to the object being ground, which is not so important for chipper knives due to the special alloy steel used, but would cause trouble with paper knives or slitters. Moreover, water will cause rust on the grinder table, knife bar, and exposed parts and wear out the machine in a very short time.

Soluble oils for grinding, added to water, do an excellent job. The soluble oil should be of the type specified for grinding applications. That is, it should emulsify in hard or soft water, should permit grinding dirt to settle, must be relatively stable and have good detergent or cleansing action. The latter property keeps the work, the grinding wheel and the machine clean so that

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stock may be removed accurately and rapidly.

A careful study of field experience indicates that one of the main factors in the performance of a grinding emulsion depends to a great extent on how clean it keeps the wheel and the work.

The coolant pump and piping should be of ample capacity. Due to the abrasive material being pumped the pump impeller wears and the efficiency of the pump is lowered and there should still be sufficient volume for proper operation. Small pipe lines are a nuisance due to plugging, cutting off the coolant stream and burning the knife.

Coolant tanks generally supplied with a grinder seldom have sufficient capacity. A capacity of 40 to 50 gallons is an absolute minimum for safety and to allow time for settling. A tank of 80 to 100 gallon capacity (or larger) is advisable. A tray set on top of the tank, with baffles dividing it into sections, serves as a good dirt catcher and lengthens the life of the pump.

Now that we have described the grinding machine we should add that it be set on a heavy concrete foundation and insulated from the building, if vibration makes it necessary. The machine should be set in a well lighted and clean location so that there can be no excuse for not doing good work.

In the field we do not always agree with the recommendations of either the grinding machine or grinding wheel manufacturers. They are more often interested in a fine finish, where as in Chipper Knives we are more interested in stock removal without burning, with a fair finish. *Insurance against burning* is the most *important* factor.

To accomplish this result the grinding wheel or segments should be self-dressing. In other words, the grain should break away fast enough to expose new cutting surface as fast as the wheel dulls. A good wheel recommendation for grinding Chipper Knives would be a Simonds Abrasive Company specification NA 36—H8—V1, or similar wheel by another manufacturer.

Coolant is used primarily to erode the dirt from the wheel to keep it cutting cool and fast. Secondly, to keep the knife cool. By having the coolant strike the wheel at about 45 degrees and ¼" to ½" above the knife edge, both results are accomplished. The edge of the knife should always be up so that heat will be dissipated by drawing it from the edge into the body of the knife. Using the other method where the bevel is down, heat is drawn from the whole surface being ground and carried to the edge for dispersion. By using this method it is practically impossible to get coolant to the edge of the knife continuously. This is where knife troubles usually start.

Burns

There are many types or degrees of burns, some barely visible, others ranging from straw color through brown, blue and black.

The dark colors generally anneal leaving a soft skin, frequently extending into the cutting edge. In chipping, the edge will round over, break away and give the appearance of being brittle. The light color burns, iridescent in color, and usually coupled with a highly polished surface showing no grinding marks, tend to harden the knife. This hardness is the result of rehardening in the grinding operation, causing a brittle condition of the edge due to lack of tempering. This also causes the edge to break away and certainly does not add to the life of the knife.

The maintenance of wear plates and bed knives should not be overlooked and tie in very closely with the proper functioning of Chipper Knives and the production of good chips. A rounded edge on the bed knife tends to produce strings and may possibly cause fracture of the knife edge due to wedging action in the cut.

In this paper I have tried to bring out the importance of *good grinding* in the making of good chips.

To our way of thinking, this is a point which has been sadly neglected in the past.

Use of Chip Weightometer in Kraft Mill Operation

By

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Southland Paper Mills at Lufkin, Texas, manufactures groundwood, unbleached and bleached kraft pulp using pine as a raw material. The pulps are converted into newsprint and cylinder board. As the newsprint furnish is approximately 80 percent groundwood pulp, then this item constitutes, roughly, 60 percent of the total pulp production.

In the manufacture of mechanical pulp from southern pine, it is desirable that only relatively smooth logs that are free from knots be fed to the grinders in the interest of prolonged stone life. With this in mind, a sorting belt is used at the discharge of the barking drums to send the relatively smooth and fresh logs to the groundwood mill, diverting the balance to the chippers for kraft pulp. This necessarily imposes the use of the poorer portion of the wood on the kraft mill operation.

With this type of chips going to the digesters, the uniformity of loading would naturally be a critical item in the process of producing pulps of comparable characteristics from one digester to the other, day in and day out. The chips are withdrawn from an outside storage tank equiped with an electrical vibrator to discharge the contents on a belt which carries them to the digester. A totalizing integrator for each of the three digesters and a master totalizer, all located on the panel board, are used to cover continually the full operation.

The location of the Weightometer is a problem that necessitates quite a bit of consideration. Formerly, when overhead chip bins were in use, there were no effective means of weighing chips. However, in recent years most installations have been in the form of storage tanks with belts conveying the chips to the digester. These tanks may be of varying shapes and capacities, both inside or outside, long low type with several separate discharges, or high conical types with single discharges. In this instance, with a high conical tank, the Weightometer is located near the bottom of the belt but just far enough from the tank discharge to clear the foundation. The chips fall directly from the tank and pass over the Weightometer in a matter of seconds, instantly starting a record of the weight for each digester loading. This location also places the instrument near enough to the ground level for convenience in case of breakdowns, making it accessible for repairs.

The advantages of a Weightometer in actual cooking practice are difficult to evaluate with any degree of accuracy. Nevertheless, it constitutes one of the most accurate accounting methods of determining total wood, as wood, used in the digesters. Provided a moisture content can be established on the chips, a daily figure can be established on wood consumption that is invaluable in the determination of digester yields. The yields would naturally be influenced by the season and by difference and location of growth; that is, fast growth, slow growth, highland and lowland growth, and the dif-

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ferent specie of pine. In the light of present pulpwood costs, all of these factors are important in considering the advantages of weighing chips to the digesters. Provided they are used for that purpose, Weightometers can make possible a more accurate basis for cost accounting. In operation, the cooks record total weight of chips used in the charge on the same line as the other data for each digester. This is nothing but an indication of the variations of the extent of loading from one digester to the other, provided the chips are of the same density and moisture content. With the above conditions in mind, observation of chip weights from day to day give some indication of fluctuations of moisture and density and, correspondingly, age of the wood.

In actual cooking, the active alkali, total volume, steam pressure and permanganate range are established and remain constant. With a variation of 10% to 15% in total chip weight, it is often necessary to change the time up to full pressure and the time on total pressure to stay within the hardness range. The cooks always sample the digester from five to ten minutes before it is supposed to blow. Any variation in chip weight from that of normal gives them some indication of how long to hold the digester after the sampling. Under conditions of extremely wet or dry wood periods, as indicated by radical changes in Weightometer measurements, it is occasionally necessary to change the total volume of the schedule in order to maintain the same active alkali concentration in the digester.

The chip moisture is determined on daily composited samples of chips. The average of these figures is used to establish the tons of air dry chips to the digester. It appears that with this much information available, it would be the desire of the operators to change the digesters with active alkali to correspond to the air dry weight of chips as indicated by the individual Weighometer reading. It so happens that the pulp produced in this mill is a compromise between easy bleaching pulp and using this established compromise, the operators have become very effective in their ability to stay within the designated cooking range. This ability has been very advantageous, because to date there has been too much variation as a result of wood sorting in woodyard operations to warrant the use of chip moisture and total weight as a governing factor in the addition of active alkali to the digesters.

Based on experience in this mill, the possible advantages to other mills in the use of the Weighometer are rather numerous. For instance, if the digesters are the bottleneck to increased production in a plant, the Weightometer could be used to indicate that the digester loadings were being maintained at maximum capacity. In research and experimental cooking, studying the variables in the process, the Weightmaster has been invaluable in eliminating the variable of chip weights. Uniform loadings should constitute a definite advantage in the manufacture of specialty pulps in the form of particularly high strength products or dissolving pulps, or in any instance where this feature would be an advantage. In many cases pulp mills operate in conjunction with some other logging operation, using slab wood, culls and all kinds of sawmill waste as raw material, without any good method of measuring the amount of these materials. With a Weightometer in use, the sawmill would conceivably be credited with the exact amount of raw material transferred from its operation to that of the pulp mill. At the same time, the pulp mill operation would have a direct indication of any change in the constituency of the wood waste by any change in the Weightometer readings.

Certain basic factors remain constant throughout the industry, but the above findings are based solely on the experience in this instance and in this mill. Inasmuch as direct cooking is employed, and disregarding cost and density of wood and yields, the benefits derived from uniform cooking alone will justify the cost of installation and maintenance of this equipment.

Lubrication and Its Effect on Paper Mill Operating and Maintenance Costs

By

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The markets for paper and paper products as well as most other manufactured products are becoming increasingly more competitive and no one will question the pressing need for economy. In any paper mill, maintenance is generally considered to be one of the most costly of all operational expense items. It is an established fact that scientific lubrication helps manufacturers avoid excessive maintenance expense as well as lengthen the life of machinery and improve both quality and quantity of production.

Lubrication is the basis of preventive maintenance, which is far less costly than corrective maintenance. In other words, an ounce of prevention is still worth a pound of cure.

Most progressive plant operators are convinced that it is economical to use and scientifically apply the proper lubricants but are not quite certain of the extent of the benefits to be derived or the steps to take to accrue these benefits. It is the intent of this paper to show the ways in which improved scientific lubrication and a well organized lubrication department, which entails a relatively small investment, can affect the economy of operating a paper mill.

One of the most important savings that can be made through scientific lubrication — and one which is often overlooked — is the savings in power consumption by reduction in frictional losses. For example:

Actual tests on an electrically driven newsprint machine showed approximately a 30 percent reduction in starting load and a 10-20 percent reduction in running load by changing the type of lubricant and the method of application on dryer journals.

In another mill where the machine turbines were loaded to capacity, a change in the type of lubricant and method of application on dryer journals reduced the running load so that machine speeds could be increased 300'/min. with the same turbines.

Another example is that of a screen driving motor which would not stay on the line. A check of the power consumption indicated that this motor was overloaded approximately 100 percent. By changing the type of grease in the anti-friction screen bearings the power consumption was decreased to motor capacity which represented a 50 percent reduction in the power consumption of this unit. It is not inferred here that this example represents any tremendous saving in power but it does serve as an excellent example of how the right lubricant in the right place can help to maintain trouble free pro-

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duction in a paper mill.

The details of the foregoing are not being covered because, first, time will not permit and secondly, conditions vary so greatly from mill to mill that each case has to be studied individually. The point is that these examples illustrate what has actually been done and emphasize the opportunities that do exist. Too often the full significance and importance of lubrication is not realized.

It might be well at this point to discuss briefly just how the proper lubricants can reduce power consumption or the load on a machine. As you all know, the mechanical efficiency of a machine is represented by the ratio of the output over the input. The difference between the two are the frictional losses. There are two types of friction found in machine elements—metallic friction and fluid friction. There is possibly a third type which is a combination of metallic and fluid friction such as is found in machine elements operating under so-called boundary conditions. Metallic friction is that occasioned by the contact of two unlubricated metallic surfaces and results in the generation of considerable heat, excessive wear and, naturally, a high power loss. Fluid friction is the result of the shear of a lubricant film separating two surfaces moving at different speeds.

Heat, of course, is also generated in this instance. The job is to replace metallic friction with fluid friction. By so doing, input to machinery can be reduced or the output can be increased, resulting in higher machine speeds and increased production. Wear on machine elements will also be minimized resulting in fewer replacement parts, lower maintenance costs and uninterrupted production.

Metallic friction is occasioned, in some instances, by machine elements being completely neglected insofar as lubrication is concerned or because of the non-functioning of lubricating devices due to injury or through becoming clogged with contaminating materials. A careful survey of the entire mill will reveal these trouble spots. More often, however, metallic friction will be found in those bearings, particularly in the drier section, which are operating under boundary lubrication conditions. Under these conditions, there is intermittent contact between the bearing and the journal. They result when the bearing design, speed, load or method of lubricant application are not favorable to the formation of an oil film and the bearing does not operate under the laws of fluid film lubrication.

When bearings are found to be operating under boundary lubrication conditions, an investigation of the contributing factors is absolutely necessary. Many times it will be found that the lubricant is being applied at a point where it is completely ineffective insofar as forming an oil wedge is concerned. If at all possible, the lubricant should never be applied into the pressure area of a bearing. By simply changing the point of application of the lubricant, fluid film lubrication can be obtained and metallic friction eliminated. In other instances, it will be found that loads on the bearings are high and the rubbing speed of the journal is below the minimum rubbing speed at which a full fluid oil film can be developed. For such conditions a lubricant having higher oiliness and film strength characteristics should be used. The two examples mentioned previously are excellent illustrations of what can be done on some drier sections by changing the type of lubricant and the method of application.

Fluid friction can be reduced to a minimum by the selection of the proper lubricant for a given application. In any given plain bearing operating at a given speed and load there is an optimum viscosity for the lubricant. The use of any lubricant heavier than this will result in the generation of enough heat through fluid friction to raise its temperature to the point where its viscosity approaches the optimum. As you know, the viscosity of petroleum oils decreases with an increase in temperature so it follows that the heavier the oil installed in a plain bearing above the optimum, the higher its operating temperature will be and, naturally, the higher the friction losses.

As mentioned previously, the greatest opportunity for savings through efficient lubrication is in the drier section so more time will be spent on this phase of operations than the others.

You all are, undoubtedly, familiar with the various types of drier bearings and the methods used for lubricating same. It is beyond the scope of this paper to do more than mention these various types.

In slower speed and older machines, drier journals are often equipped with plain open brass or bronze bearings and are usually lubricated with block greases. Journal temperatures using block grease have been measured anywhere from 175°F. to 300°F. and it is practically impossible to make one block grease which will satisfy all conditions. Block greases that will function properly at temperatures around 300°F. will not feed at low temperatures which results in a starved bearing. On the other hand, block greases which perform satisfactorily at low temperatures will melt down too rapidly at high temperatures. In other words, conditions on each machine must be studied before a proper lubricant recommendation can be made. A good block grease has some advantages such as ease of application and the elimination of run-off. One disadvantage is that they usually provide only boundary lubrication which results in high starting loads and generally speaking, high running loads. Block greases should be checked weekly to note whether the surface in contact with the journal is glazing or carbonizing. This surface should be oily and slightly spongy to the touch.

Similar bearings are sometimes oil lubricated, the oil being applied by such devices as bottle and wick-feed oilers, some use a combination of block grease and oil, others are waste packed, still others are ring, chain or collar oiled. Most of these bearings still operate, however, under boundary conditions but in general their starting and running loads are less than those bearings which are block grease lubricated.

All of these devices have been used successfully under certain conditions. In general, bottle oilers should be limited to slower speed narrow machines where journal temperatures are below 200°F. An oil having a viscosity of 600 SSU at 100°F. is satisfactory. Wick feed devices have a wider range of application and have been successfully used on machines up to 1100 ft. per min.—160" wide with journal temperatures up to 270°F. Their adaptability to a wide range of conditions results from their ability to utilize higher viscosity oils and to vary the rate of flow by increasing or decreasing the number of wicks. Depending on the particular machine and its operating conditions, oils with viscosities from 600 to 2000 SSU at 100°F. are generally used.

The type of wicks used is very important particularly when it is desired to control the rate of feed. Strips of wool cut from wet felts are often used but are difficult to regulate properly and their use is not recommended. Four strand wool wicking is most satisfactory and is generally available. Care must be taken to insure that the wicks do not become clogged inasmuch as if not occasionally cleaned, will gradually feed less oil. Run-off on these devices is apt to be excessive and result in oil staining the edge of the dryer felt and shortening the felt life. With the correct oil, proper wicks and intelligent supervision, however, they are very satisfactory and generally give low starting and running loads.

This same types of bearings on some machines are also lubricated by means of rings, chains or collars which dip into an oil reservoir and carry oil to the journal. This type of lubricating system has been successfully applied to various types of machinery including paper machines. When it is applied to drier journals the oil used should be of high quality and extremely stable inasmuch as it is subjected to very severe service, being rapidly re-cycled and continuously exposed to the high temperatures which are typical of such installations. In addition there is always the possibility of contamination of oil by paper fly, dust, etc. All of these factors cause an oil to oxidize quite rapidly. The products of oxidation will build up in the oil reservoir if not properly handled to the extent where the ring, chain or collar will become inoperative and the bearing starved. It

is imperative that only high quality lubricants be used in these systems and that the oil be changed frequently. The oil reservoir should be flushed at each oil change.

Frequency of oil change must be governed by conditions peculiar to each machine. It is well to remember though that the rate of oxidation for petroleum oils doubles for each 20°F. rise in temperature. You can readily see that the higher the journal temperature the more frequently the oil should be changed. It is also well to remember that journal temperatures vary widely from the wet end to the dry end of the machine and that the back side journal temperatures are generally higher than those on the front side. All of these conditions should be taken into consideration when establishing oil change frequency.

To some drier sections equipped with ring or collar oiled bearings have been added circulating systems. These permit cooling of the oil and the removal of contaminants and oxidation products before reintroducing the oil to the bearing. Oil is usually introduced to the top of the bearing and the oil level in the reservoir maintained by an overflow. The rings or collars function as before. With such an arrangement, the oil is not subjected to as severe service but by continuing to use the rings or collars and maintaining the necessary oil level, it is still impossible to completely renew all of the oil in the reservoir on each cycle. By providing for a more rapid rate of feed, however, it is possible to eliminate the rings or collars and remove the oil from the bottom of the housing, thus renewing the oil in the reservoir on each cycle. When properly filtered, the oil in such a system will remain in good condition indefinitely. Of course the oil should be of the highest quality and have good water separating characteristics. The life and service of the oil will depend almost entirely on how efficiently it is handled.

Circulating oil systems are also employed for drier bearing and gear lubrication on the newer, larger high speed machines. These machines use both plain and anti-friction bearings and represent the latest in paper machine design.

The problems presented by those machines using anti-friction bearings are somewhat different than those discussed previously for other types. If the bearing housings are designed and arranged so that the bearings can be easily inspected both on the front and back side and if the oil enters and leaves the housing in the proper place, these new machines have little to be desired from a lubrication standpoint.

These newer machines operate at much higher speeds than the older machines and in some instances are using steam in the drier drums up to 100 lbs. per square inch. These high steam temperatures naturally result in high journal temperatures. Such temperatures, plus water, paper fly and other contaminants, subject the oil to severe service. The oil is required, of course, to adequately lubricate the bearing which, as mentioned previously, is fairly simple. In addition, the oil must protect the bearing against corrosion due to moisture and maintain the bearing and housing in a clean condition, as free from deposits as possible. To meet these requirements the oil must be of a high quality so that it will have maximum resistance to oxidation. It must contain additive agents that protect metal parts against corrosion due to moisture. It must also be able to separate readily from the water it picks up from the system.

In addition to lubricating the bearing the oil also serves as a flushing medium. In performing this latter function it cools the bearing and carries water and other contaminants to the filters and settling tanks where they can be removed from the oil. In order to efficiently perform this function an adequate supply of oil must be admitted to the bearing. In general, three pints per minute per bearing has been found to be satisfactory. This figure might vary slightly up or down on different machines.

Even though an oil having the desired characteristics is used it will not perform satisfactorily if handled improperly. The capacity of the lubricating system should be such that the oil is allowed at least one to two hours rest before being re-circulated. Some of the circulating systems on the newer machines contain as high as 12,000 gallons. Full flow filtration is necessary if the oil is to be maintained in good condition. Most systems employ bag type filters. Such bags should be cleaned frequently. The frequency of cleaning will vary with the machine conditions. Some mills supplement their bag type filters with centrifuges and cellulose packed filters arranged on a by-pass set-up. Another aid to keeping the system in good condition is to clean the settling tanks periodically. Some mills use an extra tank large enough to hold all of the oil in the system. Once a year the entire batch is pumped into this extra tank and the regular tanks cleaned. Proper handling of the oil in these systems cannot be emphasized too strongly.

Equipment in the yard, wood room, pulp mill, beater room, etc., as well as the wet end and press sections of the paper machine have not been covered but opportunities for power reduction through improved lubrication exist with this equipment also. Ambient and service conditions here too must be carefully analyzed before the proper lubricant is selected. Of necessity, this equipment can only be covered generally by describing the types of lubricants available to meet the various conditions usually found in these parts of the paper mill.

The petroleum industry, like the paper industry, has expanded tremendously over the years and through research and engineering "know how" is constantly improving its products. Today we have lubricants which if properly applied in the rightp lace will adequately satisfy practically any set of conditions.

There are available both extreme pressure greases and oils which will adequately protect and reduce the power loads on that equipment which is subjected to shock loads and rough service such as is found in the yard and wood room. There are also the heavy bodied straight mineral oils and greases containing a heavy base oil that many times will satisfactorily lubricate this equipment and other equipment when it is decided the loads are not quite in the extreme pressure range.

Extreme pressure lubricants have a very definite place in the paper mill. These lubricants are available in a wide range of viscosities and have definitely proven themselves to be greatly superior to other types of lubricants for all types of enclosed gear drives, particularly of the hypoid and worm type. They have also proved themselves to be extremely effective on slow moving and heavily loaded bearings of both the plain and anti-friction type.

As discussed previously in connection with drier journal lubrication, there is a definite need for oils of high quality which have high chemical stability. These oils are available in the medium viscosities suitable for circulating systems as well as in the heavier grades for use on those bearings lubricated by ring or collar or those anti-friction drier bearings lubricated by constant level devices.

Block greases were discussed previously and the conditions this type of lubricant must meet were pointed out. There are many grease applications around the mill such as the wet end of the machine, various types of pumps, etc., which require a grease that will resist the washing action of water. There are several very excellent greases that will satisfy thse conditions. Greases possessing high melting point and high stability characteristics suitable for anti-friction bearing application under both normal and high temperature conditions are available in suitable consistencies.

A wide variety of lubricants for the power plant, machine shop and other auxiliaries are also available. All of these lubricants if properly selected and applied will reduce power consumption to a minimum.

In addition to reducing the power consumption on paper mill machinery, an efficient lubrication program when properly and intelligently organized, managed and staffed will actually save dollars and cents in the cost of lubricants by eliminating waste. Too often unsuitable lubricants are fed in excessive quantities to make up for their lack of quality. Such practice is not only wasteful but many times causes damage to machinery and product. Scientific lubrication—not just oiling—

will result, in addition to the foregoing, in an increase in the life, accuracy and efficiency of your machinery, a reduction in the cost of replacement parts and insure uninterrupted production.

The first step is to determine just what constitutes an efficient lubrication program and what steps should be taken to obtain it. Then, a capable, technically trained man, preferably a mechanical engineer who understands the design and operation of paper mill machinery, should be selected to head the Lubrication Department. His title should not be Chief Oiler but Chief Lubrication Engineer. Next, this man and other supervisory personnel should select the required number of men whose duties will be the actual handling and applying of the lubricants. The number of these men will, naturally, vary with the size of the mill. These men should not be just pensioners but young, ambitious men who will take an interest in their job of caring for the machinery. If properly chosen, they will progress rapidly and will get excellent training in all phases of paper mill operation.

The next step is to set up a short training course, usually in the form of lectures on petroleum technology, the fundamentals of lubrication and the handling and applying of lubricants.

A complete and detailed lubrication study should now be made on all equipment. A Lubrication Engineer from your lubricant supplier should be included in this survey. His knowledge of petroleum products and his experience in other mills will prove to be quite helpful to you. In the survey particular attention should be paid to the type, size and manufacturer of the equipment, the type of bearings, the conditions under which it must operate and the method of lubricant application. Any other pertinent remarks regarding peculiarities of the unit should be noted as an additional guide to the selection of the proper lubricant.

Following the survey, a lubrication chart covering all equipment can be drawn up. This chart should show each machine and each point of lubricant application, method and frequency of application and the lubricant to be used. Selection of the lubricants should be made on the basis of quality and performance. Thought should also be given to maintaining the number of brands of lubricants to a minimum.

Provision should be made for the proper storing and handling of lubricants. They should not be stored outside if at all possible. They should be stored in a clean, well ventilated room and should be clearly identified and easily accessible. Adequate distribution and application equipment should be provided. Finally, the charts should be in such form that those responsible will have no trouble in applying the right lubricant in the right place.

Naturally, for any such system to work properly it must be controlled. In this connection adequate records must be kept. Frequency of application for each unit should be recorded with space allowed for the date these units are actually lubricated. Consumption records should be kept. These should be broken down to various departments so that adequate cost records can be compiled. These records can then be tied in with maintenance records and will definitely show the effect of lubrication on maintenance.

One mill which operates several of the newer type machines whose drier sections are equipped with anti-friction bearings, keeps a record or case history of each individual bearing. This record shows the complete history of each bearing including the date installed, dates inspected, condition at time of inspection and date replaced. This mill observes the practice of turning their bearings 180° when the loaded area begins to show signs of failure. This date is also recorded against each bearing.

Such organization might appear on the surface to entail a tremendous amount of work and time but actually once the department is set up it will operate efficiently with very little effort.

Mills that have a well organized Lubrication Department headed by a responsible individual have saved in lubricant costs alone more than the expense involved of operating the department even in the first year such a program was in effect.

We have attempted to show in the foregoing how scientific lubrication will reduce operating and maintenance costs and the steps that must be taken to obtain these savings. The petroleum industry through its competent and experienced corps of engineers and its research facilities is ready and willing to assist you in any phase of this program. By periodically consulting with your lubricant supplier you will be able to keep abreast of the times in regard to the latest in lubricant developments and utilize to the maximum the benefits of scientific lubrication.

The Maintenance of Anti-Friction Bearings In the Paper Mill

By

GEO. H. SPENCER

The Torrington Company, Torrington, Conn.

Can any new idea or thought be added to the subject of "Maintenance of Anti-Friction Bearings in the Paper Mill"? Perhaps not much, particularly if the literature already available on the subject has been carefully studied and put to work for an individual paper mill's needs and requirements.

A lot of this business of proper bearing maintenance is reasonably simple, but is there not linked with it the same necessary need for enforcement which many of us frequently display in those hours at the end of the day spent at our fire-sides. Don't we give to our off-spring the same advice, the same counsel and helpfullness, even as our own fathers before us, day by day, year in and year out and lo! sometimes a good youngster is raised.

What a prosaic subject, "maintenance of bearings etc." so let us start by looking "at the record" for some assistance and perhaps some new approaches to a really vital subject.

First, there are many excellent and expansive pages of pertinent facts regarding the operation, mounting and demounting, care, maintenance and lubrication of anti-friction bearings in the catalogs of many good and well known bearing companies. Much of this data, particularly of late years is the result of early and really painful experiences. Most of it is no longer immature data offered to the bearing consumer by the exigencies of sales for bearings. Most of it is worth reading.

Second, our own Superintendent's Association in the form of a $3.00, 80 page publication entitled "Preventative Maintenance in Pulp and Paper Mills" produced as a partial record of the proceedings of the General Maintenance Conference, held March 25-29th, 1946 at Middletown, Ohio, a splendid 11 page article on the "Role of lubrication in paper mill maintenance" by Mr. A. I. Sippola of Socony-Vacuum Oil Co., Inc., New York, N. Y., plus other good references to bearing designs, care and maintenance.

If any one has not read Mr. Sippola's article, he has missed one of the most comprehensive and practical discourses on the subject.

Third, a reference is made later in this paper to two other worthwhile publications sponsored by oil companies.

Fourth, there is available for free distribution, a 19 page booklet com-

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piled by the Engineering Committees of the Anti-Friction Bearing Manufacturers Association, Inc., 60 East 42nd Street, New York 17, N. Y., entitled "Anti-Friction Bearing Maintenance", to be ordered by referring to publication No. AFBMA-100.

This publication gives the following data with photographs and line drawings:

a) Bearing parts and their names.

b) All well-known types of anti-friction bearings.

c) Three pages devoted to explaining correct use of and proper demounting of bearings. Also proper use of bearing tools.

d) Pages with plenty of photographs showing proper cleaning, protection, remounting and assembling of bearings; also good advice on correct lubrication methods.

e) Last, but not least, a concise list of "do's and don'ts".

This publication should definitely be in the hands of all and every individual who touches and even looks at an anti-friction bearing in a paper mill. It is free for distribution to anyone in Industry.

Fifth, an available publication dated June 23, 1944, edited by the Navy Department, Bureau of Aeronautics, Washington 25, D. C., called Technical order No. 87-44 entitled "Bearings, Aircraft Anti-Friction, Reconditioning and Reuse Of."

Please do not let this reference to aircraft scare us. This publication is far reaching in its information. There are nine meaty paragraphs on "removal and installation of bearings". There is not an unnecessary word.

There are three paragraphs on general procedure for cleaning bearings, also three paragraphs on "handling after cleaning and before inspection; then four paragraphs on inspection covering visual, hand and noise tests; a final paragraph on lubrication and also one on preparation of bearings for storage and lastly, the customary "Bearing Don'ts".

And, sixth, there is a 24 page restricted document covering "inspection procedures for anti-friction bearings" published by authority of one of the branches of our U.S. armed forces replete with 60 photographs. The reason that reference is herewith made to it is that among these photographs are contained 31 illustrations of typical visual evidences of bearing deterioration forming the basis for the rejection of the inspected bearing or bearings for further use.

In order to arrive at a concept of causes for rejection of bearings, these 31 illustrations can serve us well in any explanatory effort in our own Paper Industry which will better permit us to more thoroughly understand the salient causes for bearing failures and thereby try to improve our usage of them.

A regrouping of this authoritative work gives us the following informative data:

Bearing Failures from Corrosion

Corrosion is evidenced as a reddish brown coating and small etched holes, that attacks the metal surfaces and will develop surface fatigue during operation. Do not confuse tarnished surfaces (discoloration) with corrosion.

Many times, corrosion, say from fingerprints, which is not located on the rolling surfaces of bearing elements can be removed and thus save a bearing, even though a slight change may be made in its dimension tolerances and some pit marks remain.

Regarding pit corrosion in the rolling elements of a bearing, a close grouping of which is a cause for bearing rejection, this is most due to free moisture, acid fumes and sometimes by having the elements remain above the lubrication level for certain periods of time and thus subjected to atmospheric conditions without proper protection.

With large expensive bearings, the question sometime arises as to salvage of some of its parts. Rolling elements and sometimes the raceways of a bearing that have been subject to corrosion can be replaced providing there are no resulting changes in overall tolerances and dimensions from the original bearing.

Bearing Failures from Abrasion and Foreign Materials

This is the most common cause of damage to anti-friction bearings. The foreign matter may get into the bearing during initial assembly of the machine, during repairs or from the atmosphere during operation of the machine, also sometimes from an adulterant in the lubricant and/or from entrance of foreign materials through inadequate sealing at the bearing housing and covers.

Soft or fine foreign material will produce lapping of the bearing elements with resultant wear evidenced by the bearings becoming loose and noisy.

Hard foreign materials, such as iron, steel and other metallic particles, usually introduced when assembling the machine, will produce small depressions that look different from those produced by overload failures, acid etching or corrosion. Inner races may turn on the shaft or outer races turn in the housing due to the resultant binding action.

Corrosive oxides formed by deterioration of lubricant aggravated, of course, when moisture and acid fumes are present, will become a good lapping agent in the rolling elements of the bearing, causing wear, producing a dull gray color on the balls or rollers and rolling paths of the bearing, distinguishable from the reddish brown color of the rest of the bearing.

Bearing Failures from Overload, Fatigue, Etc.

Under proper operating conditions and provided that the proper size and type of bearing has been selected for a given application, anti-friction bearings do not develop a perceptible amount of wear throughout their useful and prescribed life.

However, it is well to have some knowledge of the significance of the appearance of a bearing that has been removed for examination after a supposed failure from overload and/or fatigue. In this regard, let us clear up first the distinction between a failure from "spalling" and one from "flaking".

"Spalling" is evidenced by chipping off of the top surface of raceways or rolling elements and is generally caused by corrosion and oxidation due to free moisture and acid formation. The undamaged parts of the bearing must, of course, show evidence of corrosion and oxidation.

"Flaking" is a deterioration of the molecular structure of the metal in the bearing. Such a failure starts in a small area and spreads rapidly. It is an actual breakdown of surface structure and is due basically to excessive load or excessive use of the bearing, when exceeding its life expectancy rating. If short service life is experienced, the indication is a severe and abnormal overload condition. Momentary overload will not damage bearings to the point of fatigue.

"Flaking" areas which occur mostly in the raceways are usually in the magnitude of .01 inches diameter in the beginnings of a failure, but regardless of this magnitude, the bearing must be replaced. Most frequently, the "flaking" starts on the inner race. A wide ball or roller path subject to "flaking" indicates excessive loading. "Flaking" of the balls or rollers usually shows up as stress cracks or fractures due to loads in weak areas, likewise with the raceways.

Let us not, however, confuse these stress cracks, which are in reality only surface cracks, with the cracks and complete fractures of inner races of bearings which are usually due to excessive tight mounting fits on the shaft or possibly by cocking the bearings during mounting or removal of them.

Miscellaneous Failures of Bearings

a) *Misalignment*—confined mostly to rigid type ball and roller bearings, which do not possess in their design the inherent ability to compensate for misalignment. Of course, carefully designed external housing contours or aligning plates, the former set into outer cradles or holders, will usually offset any impending troubles.

A rigid type bearing in a solid housing, for example, may operate with perfect satisfaction until something occurs to force the inner race into an off-square condition. This is quite possible by either an out-of-line condition,

by incorrect mounting either on the shaft or in the housing, or just a plain shaft deflection; all three or any one of these factors extending in their effectiveness beyond the bearing manufacturers' normal built-in clearances of the bearing elements and thus cause premature bearing failure.

Under any of these conditions, the balls and/or rollers may jam in the retainer pockets, thereby causing the retainer to crack, then finally break with neither of the raceways failing except for slight roughening of them from the metallic particles deposited by the failing or failed retainer.

A bearing in the process of failing under the above described condition, will first heat up, resulting from binding of the retainer. Also, small chips from the retainer may break off and appear in the lubricant.

b) *Thrust in wrong direction*—does not happen too often and is really only confined to bearings of the angular contact type.

c) *Electric arc pitting*—a most unusual cause of trouble, caused by electric current passing through surfaces of bearing elements and thus melting the molecular structure wherever the current travels. This phenomenon is distinguished by zig-zag more or less continuous lines on the inner raceway, caused by arcing of the current from the races to the balls or rollers and back again. This type of failure is most common, of course, on electrical equipment.

d) *True brinelling*—an occurrence which is identified as visual as a short series of ball and roller indentations, equal, of course, to the distance apart of the individual rolling elements with the center indentation or depression larger than the adjacent ones. The cause is usually due to extreme and/or off-center blows or pressures applied to the outer races of bearings when installing them onto shafts or to inner races of bearings when installing them into housings.

e) *False brinelling*—occurs when bearings do not rotate for extensive periods of time as, for example, in the application in the large tapered loose pulley on a right angle belt driven paper machine drive.

Also false brinelling of greater intensity occurs when rolling elements actually skid and slide without rotation as, for example, in the shipping cross-country of a large calender roll with the bearings and housings mounted onto the journals and supporting the full weight of the calendar roll.

This type of failure is easily recognizable by the presence of depressions or pockets, a bit elliptical for example No. 1, but deeper and occurring faster in the case of example No. 2 above mentioned.

Bearing Failures from Heat

This type of failure is probably of more concern to the Paper Industry than any other, referring to anti-friction bearings on Paper and Felt dryers. As regards failures due to heat on all other locations on the paper machine, the main cause is due to overgreasing or overlubrication.

Twenty-five or more years ago when bearings were first used on Paper machines, the early headaches were the water exclusion problem from bearing housings, the load problems when for example, actual tensions on wires and wet felts were not really known; the life fatigue problem when not only bearing manufacturers but every machinery manufacturing group, such as pump, gear, motor and accessory equipment concerns had to find out how to build equipment to withstand the 24 hours per day grind, month in and out, and year by year.

Though great strides, particularly since V-J Day, have been made in the satisfactory operation of anti-friction bearings on Paper Dryers and actually, there are some installations running over 20 years with hardly a bearing replacement, there is still some more to be learned. It is not the purpose of this paper to cover in great detail this immense subject of Paper Dryer applications. Frankly gentlemen, an Association committee group could probably do a splendid service to the Paper Industry by taking under its wing this exhaustive subject.

Failures of bearings on Paper Dryers could in a small way be due to one or a combination of factors effecting and producing bearing failures as previously outlined in this paper, plus the highly potent factor of stabilization and proper functioning of the lubricants used.

The oil companies as a group and individually have done an outstanding job in improving quality of product and developing new lubricants where needed. The publications, for example, as arranged and set forth by such concerns as The Texas Company, referring to their publication "Lubrication of the Paper Machine" dated May 1946, Vol. 32 No. 5 to be revised next month, July: also Texas Company's article in "Paper Mill News", November 13, 1948, regarding their Ursa Oil X ** and Socony-Vacuum Oil Company's TAPPI paper "Paper Mill Lubrication—Dryer Bearing Circulation Systems" by Mr. A. I. Sippola describe the advances being made.

Also, such specialists as Bowser Company, Inc., Fort Wayne, Indiana, referring to their Mr. E. M. May's paper "Modern Dryer Bearing Lubrication Systems", appearing in May 24, 1946 issue of "Paper Mill News" and similar groups have likewise added enormously to the hopeful solution of the problem under discussion.

Those bearing companies who are directly involved are doing their utmost on this matter. It is a large subject. It is one of vital importance to successful and economical mill operation. May I close with the expressed conviction that without the real help continually being given to all of us *on the outside* by the operating groups, that is, the superintendents, plant engineers, master mechanics, maintenance men and including the storekeepers *on the inside*, that our problem may have been insurmountable. As it is, progress is being made through the co-operation of all concerned.

The Hydronamic Flow for Vats

By

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On the cylinder machine of today, modern forming equipment reaches its maximum efficiency only when incorporated in a flow system in which each component part can operate to its best advantage. To do so, each component part must function perfectly in itself, and, more important, function perfectly in relation to all other parts of the flow system. Such a system must be engineered as a whole and suitable equipment be utilized.

Involved in a vat flow system of today is the vat assembly, the cylinder mold, the inlet to the vat, the screen, a mixing device, the flow piping, the pumps and the system controls.

The Black-Clawson Uni-Flo Vat, of the overflow type, equipped with a Hydronamic inlet and Selectifier screen is typically representative of such a flow system. Here proper parts in proper relationship combine to give maximum performance.

The Uni-Flo type vat has capabilities not inherent in other types of vats, but for its most successful operation, there must be incorporated in its flow system suitable component parts. The Uni-Flo vat can operate at high volumes with low consistencies, with resultant level and smooth formation. However, to do so, the flow to the vat must have uniform fiber dispersion and be evenly distributed across the full width of the vat.

To this end, the Hydronamic Inlet is a necessary part of the system. The Hydronamic Inlet was developed to handle such large volumes of low consistency stock with uniform flow and fiber distribution and is a necessary part of the system.

In any vat system, it is important to remove all possible air from the

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stock or, better yet, to prevent it from getting into the stock in the first place. Air may cause surging and will certainly cause formation difficulties of one kind or another, frequently resulting in streaks, mottling, etc.

Air usually gets into the stock through cascading over the overflow dam or cascading from the screen into a mix box or over the dam or baffle in the mix box. In fact, the average mix box often causes the entrainment of more air than it removes.

To overcome several of these inherent difficulties and minimize the opportunity for air entrainment, the Selectifier screen has been made an important part of the complete vat system and the mix box has been eliminated.

With the Selectifier screen, we have a completely enclosed flow system, utilizing two pumps. One pump, a low head, high volume pump serves as the vat circulating pump while the other serves as the screen pump.

In this system, new stock from the regulating box combines with white water at the suction side of the screen pump and is thoroughly mixed in going through the pump. The screen pump discharges the mixture under pressure to the totally enclosed Selectifier screen which in turn discharges to the suction side of the vat circulating pump. Here the mixture combines with the overflow stock and that part of the white water from the cylinder mold not required for screening.

The circulating pump has sufficient capacity to handle not only all of the white water and new stock, but the overflow as well. In this pump, these three flows are thoroughly mixed, then discharged directly into the branch cross pipe of the Hydronamic inlet, thence through the inlet and its tapered venturi connection into the vat.

As you know, the Hydronamic inlet consists of two tapered ducts extending across the width of the machine. These tapered ducts are divided by a partition plate over which there is a slot orifice equal in length to the full deckle width of the cylinder.

By means of the branch cross pipe, half of the stock is supplied to the large end of each of the tapered ducts, one on the front side and one on the back side of the machine.

As the stock flows from the large end of each duct to the small end, it is discharged through the slot orifice. Since the cross sectional area of the duct diminishes at the same rate as the longitudinal flow in the duct diminishes, the stock velocity must, of necessity, be the same at all points across the machine. This assures a uniform pressure differential across the slot orifice which in turn results in uniform stock discharge.

In this way, the same conditions as to velocity and flow exist all the way across the machine, thus enabling the Inlet to discharge the uniformly distributed stock to the vat with a minimum of cross currents or eddies.

On the Hydronamic flow system outlined, at no point outside of the vat is the stock exposed to the air where foaming, lump formation or sludging can take place and the entire system is totally enclosed and under pressure.

To completely eliminate cascading and air entrainment at the overflow dam in the vat, our Liquitrol pressure regulator maintains the stock level on the discharge side of the overflow dam at substantially the same level as the rest of the vat so that there can be no cascading. This is done by automatically adjusting the degree of opening of the valve in the discharge from the overflow compartment. This liquid level control unit is normally mounted on the front end of the vat.

To further eliminate the entrainment of air, a stock regulating valve is provided for metering the new stock and is located near the machine room floor for convenience to the operator and the stock pipe is therefore completely full of stock all the way and up to and including the stock regulating box. There is no discharging of stock through an orifice or gate in the regulating box and no cascading down into the stock pipe and the operator does not have to go up to the regulating box to adjust his weights or the amount of stock to the machine. Furthermore, any adjustment of the stock metering valve for a given vat does not affect in any way the amount of stock going to the other vats.

This two-pump Hydronamic vat flow system with Selectifier screen is completely enclosed with no air entrainment at any point.

Furthermore, by adjustment of the valve ahead of the Selectifier screen, the operator can screen at any desired consistency he chooses for optimum results with any given furnish and the balance of the white water automatically goes to the suction side of the circulating pump.

Where large volumes of water are handled, a variable speed drive for the circulating pump is preferred, but for smaller units, a valve may be used with a constant speed pump drive to control the flow in the vat.

On some vat installations, where the type of stock permits, both the screen and the mix box are eliminated and a one pump system utilized. Here a single pump takes the white water and overflow stock from the vat directly to the Hydronamic inlet. New stock from the regulating box is introduced directly into the system at the suction side of the pump and is thoroughly mixed with the white water and overflow stock in the pump.

Elimination of the screen and mix box simplifies the machine layout, saves space, reduces original cost and eliminates maintenance, and, above all, does away with slime, dirt, air entrainment and other headaches common to a mix box.

Approach Flow to Cylinder Vats

By

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As long as sheets of paper must be formed up from flowing liquid suspensions, the uniform and smooth flow of the liquid at the forming point will continue to be one of the most important factors in good formation. In a sense your sheet of paper already exists in the flow of fibers to the cylinder mold. If the fibers are uniformly arranged in this flow and the water is evenly removed without disturbance of the fibers already laid up, then uniform formation results. These facts are beginning to receive the recognition which they deserve.

It is an old saying that "A wild vat will make a wild sheet" and on many cylinder machines today the quantity of water which can be used to advantage is limited by the approach flow. As we all know, the harmful effects of currents increase very fast even with comparatively small increases in the amount of flow. Direct-flow type vats require a circulating overflow in addition to the white water flow and the approach therefore becomes even more important than with counter-flow type vats.

All arrangements for producing a uniform flow may be divided into four general types.

In the case of plain water without paper stock, large currents can be broken up by forcing the flow through narrow slots as by close baffles. By doing this repeatedly a quiet flow can be produced especially if flow velocities are made low. With paper stock this method does not work as well because the turbulence produces "clumps" of fibers. This can be shown in any vat with a smooth approach flow and good formation. If a slot is introduced in the inlet of such a vat, the formation becomes more mottled. If the flow ahead of the slot is bad enough, however, such a slot arrangement can produce improvement, but it must be considered to be one evil counteracting another greater one.

Another method often used with small or moderate quantities of flow has been the "multiple-inlet" or "manifold" type. This method consists of dividing and subdividing the entire

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flow into more and more smaller flows and changes one large current into a number of smaller ones. With large flows this will still tend to streak the sheet where the currents are, and may require that the flow be reduced—to the detriment of the formation.

The ordinary inlet hopper may be considered a third type. In its oldest forms it was short and shapeless with very little quieting effect on the flow. It permitted the flow to channel thru and surge right into the vat. It therefore often required that devices of the previous two types be combined with it.

It will be appreciated that each of the above methods will permit a quiet flow if the quantities are sufficiently small. The formation problem, however, demands an arrangement which will permit the smooth and uniform delivery of all the water which the sheet may require. Otherwise you are stopped by the approach flow from using the water required. A wild inlet flow may also prevent carrying the amount of load desired because the heavier load of stock "washes" and streaks more easily than a light load for the same flow quantity.

In the developing of a more modern and more scientific arrangement, the first step was toward longer hoppers with progressively increasing areas of flow. It was, however, found that the flow could be spread much more uniformly if the area is *reduced* during spreading. This makes of the hopper a hydraulic nozzle which forces the flow to spread uniformly across an increasing width. Simple as this method appears to us today, it was some time before we appreciated its necessity. The form of the nozzle must be such as to exert a continuous "squeezing" action during its widening. In handling large quantities it was found that a great advantage is obtained by doing this in three successive stages.

This led to our multiple pass telescopic type flow-spreader. Mill trials showed that the areas could be increased at the turn-arounds, leading to further effectiveness. The result is the single pass flow-spreader for moderate flow quantities such as are required for smaller counter-flow vats. The standard three-pass flow-spreader is recommended for vat systems which are to be capable of handling larger quantities of flow such as stream-flow vats.

The paper-making facts involved are now more generally recognized than they used to be. Flow-spreaders of the hydraulic nozzle type are more costly to build than the more primitive arrangements. There is always the temptation, and it is legitimate one, to find a cheaper short-cut.

As in most things, however, we get what we pay for. The approach flow is so important in the operation of a cylinder vat system that we believe the inlet arrangement should be adequate to insure a uniform flow to the making board, even with large flow quantities.

Paper Testing in Relation to End-Use

By

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Paper testing has been done to a greater or lesser extent for many years and has now developed into a definite well controlled system. Until recent years, most of the paper testing was devoted to determine those properties of paper which are of greater importance to the paper maker than to the printer. Practically all such tests involved the composition and strength of the paper. However, consideration of paper by printers is dependent upon properties and functions which, as far as paper testing is concerned, must have a direct bearing upon the printing quality and its use requirements for durability and permanence. The evaluation of paper properties from the standpoint of the printer may, therefore, be grouped into three major classifications as follows: (1) Physical tests for determining durability. (2) Chemical tests for evaluating the permanence. (3) Tests for evaluating the printing properties.

Paper specifications generally define the minimum quality of paper required for particular uses. Methods of testing and the apparatus used have been standardized by the Technical Association of the Pulp and Paper Industry. In recent years, the American Society for Testing Materials formed Committee D-6 on Paper and Paper Products for the purpose of developing or improving existing paper testing methods. Most of the methods adopted by this Committee are identical with the TAPPI methods.

Physical Tests for Determining Durability

The tests for strength, which include folding endurance, bursting strength, tensile strength and tearing resistance determine the durability of paper. Durability has been defined as the degree to which paper retains its original qualities under continued usage. These tests are in general a measure of resistance of the paper to a rupturing force. They differ from each other in the manner of applying this force.

Since certain physical tests of paper, especially folding endurance, are considerably affected by variations in relative humidity, it is essential that such tests be conducted under standard testing conditions. As adopted by the Technical Association of the Pulp and Paper Industry, the standard paper testing conditions in use are $70 \pm 3°$ F. temperature and 50 ± 2 percent relative humidity.

Folding Endurance

Folding endurance is an index of the resistance of paper to repeated folding. This test is generally regarded as the most valuable for papers such as writing, bond, ledger, index, cover, and currency, which are required to undergo considerable creasing and folding in use. It has been found that any paper meeting the folding endurance requirements will possess good tensile strength and will usually meet the requirements for bursting strength.

Bursting Strength

The bursting strength of paper is the pressure applied at a uniformly increasing rate at 10 pounds per square inch per second to a circular area of paper 1.2 inch in diameter which is required to produce rupture.

This test is one of the oldest and most widely used, particularly as a control test by paper mills for measuring the strength of practically all grades of paper. The results of the test give an indication of the ability of a paper to stand up under a bursting strain. Although it is affected by the kind and proportion of fibers present and to the amount of beating the fibers have undergone in preparation, a sheet may have a high bursting strength as a result of being heavily surface sized.

The test is generally termed the "Mullen," often the "pop" test, and sometimes merely the "burst."

Tensile Strength

Tensile strength has been defined as the force parallel to the plane of the specimen required to produce failure in a specimen of specified width and length under specified conditions of loading.[1]

The tensile strength test shows the resistance of paper to rupture when subjected to a longitudinal stress and corresponding strain imposed by an outside force. Although paper may be subjected to tensile stresses, failures or breaks in the paper may often also be due to other causes. Defects such as slime spots, haircuts and calender cuts in the paper may start the failure,

[1] Report No. 33—Instruments for measuring the properties of paper, American Paper & Pulp Ass'n.

Presented at the American Pulp & Paper Mill Superintendents Ass'n., annual meeting, Atlantic City, June 15-18, 1949.

but the lack of inherent strength in the structure permits the initial failure to continue.

Tensile strength is largely influenced by the kind, quality, and the treatment of the fiber constituents and by the way the sheet of paper has been formed on the paper machine.

The tensile strength is indicative of the durability and serviceability of many papers such as wrapping, bag, gummed tape, and cable wrapping which are subject to direct tensile stresses. In the case of printing papers, tensile strength measurements indicate the potential resistance of paper to breaking when subjected to strains such as during its travel from the roll through the web press mechanism in the process of printing. It fills a special need in the testing of paper such as tape or that used in printing newspapers, magazines, and textbooks on web presses.

Tearing Strength

The tearing strength, sometimes referred to as tear resistance, is the force in grams required to tear one sheet of paper. It is often spoken of as the "tear test" or the "Elmendorf test."

The tearing strength or tearing resistance is a measure of fiber length and the cementing action due to beating.

The tear test is generally made on papers which are subject to tearing strains in actual use, such as wrapping, bag, box, and shipping tags.

Chemical Tests for Evaluating Permanence

Permanence is the degree to which a paper resists chemical action which may result from impurities in the paper itself or agents from the surrounding air.

It is generally recognized that lack of permanence is due to chemical changes occurring within the paper structure. These chemical changes are caused by impurities in the paper or by unfavorable atmospheric conditions such as exposure to light or high temperatures and contact with acidic air. Among the chemical tests applied for evaluating the permanence of paper may be mentioned determination of fiber content, acidity, alpha cellulose, copper number, percent rosin, and impurities such as chlorine, iron, and sulphur.

Fiber Content

Microscopical analysis serves to determine the kind of fibers from which a paper is made. It also gives some information as to what may be expected in permanence and use of the paper. For example, ground wood and unbleached chemical wood pulp are subject to chemical change and deterioration due to the presence of lignin. Soda pulp, with its short and thin-walled fibers, tends to make a weaker paper than sulfite or a mixture of rag and sulfite.

Government specifications for the various grades of writing, bond, ledger; and index paper purchased for its use state the minimum requirement for fiber content.

Acidity in Paper

Acidity in paper may be caused by the presence of residual chemicals left in the pulp by the processes of manufacture, by chemicals such as alum, added to the paper in order to obtain certain desired results, by acid-forming chemicals absorbed from the air, or by contact with the skin when handled. Acidity from whatever source may result in deterioration of the paper fibers in strength and durability.

Paper acidity is generally measured in terms of pH which gives a measure of the effective amount of hydrogen (H) ions or the amount of active acidity or alkalinity available for reactions. The pH values that may be accurately measured vary from 0 to 14.

A very accurate analysis for acidity, or determination of the pH value of paper, is most important in the case of ragbook, bond, ledger, and index papers intended for use in permanent records. Rigid requirements for acidity are not necessary if the subject matter of the printing is regarded as of relatively temporary value, but in the case of important records, their longevity is of paramount importance and this factor must be given due consideration. Paper intended for permanent record use should be required to have a pH value of not less than 5.0 when determined by hot extraction.

Alpha Cellulose Content

Alpha cellulose is that portion of the fibrous material which is not dissolved by treatment with 17.5 percent caustic soda solution at normal temperature.

There are several schools of thought as to the value of determining the percent alpha cellulose. Some believe that chemical stability constituting permanence of paper is related to the alpha cellulose content of a pulp, contending that the higher this content is, the more permanent the paper. Others state that in some instances considerable fiber deterioration may occur before there is an appreciable loss in the alpha cellulose content. Still others state that this test is significant only when comparing the alpha cellulose content of fibers of the same kind and origin.

In Government specifications, a requirement of not less than 95 percent alpha cellulose is included in the 100 percent cotton or linen (rag) content book, bond, ledger, and index papers intended for permanent record use.

Copper Number

The copper number is defined as the number of grams of metallic copper in the cuprous oxide reduced from the cupric hydroxide by 100 grams of the paper fibers. Any copper number found above that accepted as a normal maximum for good wood pulp or for rag half stock, can usually be considered as indicating breakdown of cellulose during the process of manufacture and is very suggestive of continuous breakdown. The copper number can, therefore, be regarded as a direct index of those impurities in cellulose such as oxycellulose, lignin, and sugars which possess reducing properties. It is sensitive in detecting changes accompanying deterioration and may, therefore, be considered a good test for evaluating the permanence of paper. The test, however, falls down in the presence of zinc sulfide pigment, calcium sulfite, melamine resin, and other copper reducing non-fibrous materials.

The copper number of all permanent record book, bond, ledger, and index papers purchased by the Government must not exceed 1.0.

Rosin Sizing

The term "sizing" was originally used to mean the resistance of spreading and sinking-in of writing ink. In its wider application, "sizing" connotes the resistance to water penetration, penetration by colloidal dye solutions, and resistance to oil and printing ink. It is the process by which rosin is added to the pulp in the beater and is precipitated upon the fibers by its interaction with aluminum sulphate (paper maker's alum). This process is also commonly referred to as "engine-sizing." The main object of engine-sizing most papers is to confer on them some degree of resistance to penetration of aqueous liquids. Such papers are not rendered waterproof, but the passage of water is delayed rather than prevented altogether.

It is generally admitted that rosin is detrimental to permanence when present in excessive amounts, since it tends to produce discoloration and deterioration of the paper under the action of light. High rosin content is an index of the amount of alum used since it is usually accompanied by a low pH value. Research indicates that ferrous iron in paper accelerates the deteriorating action of rosin.

Tests for Evaluating the Printing Properties

The most important paper characteristics from a printing standpoint are smoothness or finish, ink receptivity, porosity or air permeability, surface bonding strength (pick test), opacity, thickness, moisture content, formation, color, and general appearance.

Smoothness

Printing is the process of transferring ink from forms to the surface of paper. The closer the contact of the inked form with the paper surface, the more perfect is the transfer. Therefore, the covering power or specific coverage of an ink on a given paper is influenced not only by its absorbability but also by the smoothness of the paper surface. A rough printing surface will require more ink than a smooth one to attain a definite degree of coloring or ink intensity. Smoothness may be regarded as an index of the facility of a paper to make close contact with a printing surface under

the influence of pressure. Smoothness is, therefore, one of the most important printing properties of paper. The smoother the sheet, the better the contact between the paper and the printing plate. In order to obtain good smoothness, the pulp must be handled in beating and jordaning and on the paper machine in such a manner as to yield a well closed sheet. Heavy calendering produces a surface hardness and may blacken or crush the sheet. Smooth papers obtained in this manner show uneven ink receptivity. Smoothness in recent years is being obtained with less calendering due to the introduction of fillers with finer particle size. These finer particles, it is claimed, increase the rate of the ink receptivity and make for uniform absorption over the entire sheet. Because of their small particle size, they respond readily to the calendering pressure in the manufacture of the paper and close the interstices between the paper fibers.

In Government specifications, the smoothness of printing papers refers to their finish. In addition to printing papers, smoothness is important in writing, bond, ledger, and index papers upon which writing is performed with pen and ink. Smooth papers possess better writing and erasing qualities than rough papers.

Ink Receptivity

Ink receptivity is defined as that property of a sheet of paper which causes it to absorb ink.

The quality of the ink used is of great importance, but the composition of the surface of the paper also exerts an important influence. In general, the smoother and less porous the paper, the less ink will be required. The nature and distribution of the paper filler also exert influences upon the printing quality of the ink, depending on the ease with which it is wet by the vehicle in the ink. The influence of fillers as an absorptive constituent of paper is also evidenced by the fact that the wire side of most kinds of printing papers apparently requires less ink than the felt side, although the felt side is normally smoother and less porous. In coated papers, the amount of coating, adhesive and pigment, as well as the ratio of adhesive to pigment influences the ink receptivity.

The penetration of printing inks into absorbent paper such as news and book is dependent primarily upon the vehicle used in the manufacture of the ink. Some of the ink vehicle penetrates the paper, but the pigments themselves tend to remain on the surface, except for a small portion which may be forced into the open paper structure by the printing pressure. A measurement of such penetration is informative in that it furnishes an indication of the ink receptivity of the paper. The performance of a paper in any particular job of printing may be reasonably predicted by oil penetration and surface absorption tests before the paper reaches the press. For example, strike-through may be predicted if the absorption of the oil by the paper is very rapid. On the other hand, a very slow rate of oil absorption measurements will tend to cause offset. The term "strike-through" denotes the staining of the reverse side of a printed sheet by the ink vehicle penetrating through the paper. This affects the quality of printing on the opposite side of the sheet. Offset is the transfer of ink from a printed sheet onto the under side of the following sheet during printing or, if it is folded, as in the case of forms printed on rotary presses.

Porosity or Air Permeability

Porosity has been defined as the property a sheet has of containing connected air voids. It is dependent upon the number of the voids and their distribution in size, shape, and orientation. It is the property of a sheet which allows the passage of air when a pressure difference exists across the boundaries of the specimen. The more readily air passes through the sheet, the greater the porosity. This test is sometimes referred to as density which is really the converse of porosity.

Porosity is a factor in the quality of printing papers. For example, in the offset process, porosity controls to some extent the spreading of the ink under the pressure of the rubber blanket. In illustration printing by the offset process, the porosity, especially that of the upper surface of the paper, is of particular importance. More ink will adhere to the rubber blanket than to the smooth metal plate of the letterpress printing form; and thus, after an impression is taken, a quantity of ink will still cling to the rubber blanket. The amount thus adhering will depend upon the porosity of the upper surface of the paper. In order to attain a desired degree of blackness, there must be a reserve supply of ink on the blanket, the amount depending on the porosity of the paper. The larger this excess of ink is, and the less porous the paper, the more tendency there is for the ink to spread or smear.

The test is also of value for indicating the filtering qualities of filter papers, the saturating properties of impregnating papers, and of bag and insulating papers.

Surface Bonding Strength (Pick Test)

The surface bonding strength of paper is the resistance of paper to removal of coating or fibers or to cleavage parallel to the sheet direction.

Paper is said to pick when coating, fibers, or small portions of the paper itself, separate from the body of the sheet while it is being printed. Coated paper picks due to the fact that the adhesion of the ink to the coating is greater than the adhesive power of the coating for the paper, or because there is insufficient bonding strength in the base stock to prevent its splitting. Picking of the coating is not always due to a weakness of the coating material, but may be caused by the use of an excessively tacky ink. If such is the case, the tackiness of the ink must be reduced, since the physical interaction between the ink and the paper coating depends upon their relative cohesive powers.

The surface bonding strength test has become a matter of importance since the development of multicolor printing and the speeding up of equipment.

Picking leaves small white spots on the printed image and is especially noticeable in solid areas. The particles lifted from the sheet may lodge on the printing plate or be carried back through the inking system of the press. If there is much picking, it necessitates frequent washups of the plates and even the rollers and the ink fountains. Picking also clogs the type and halftones, producing mussy printing.

Opacity

Printing demands paper having a high degree of opacity, especially when halftones or solids are printed on one side of the sheet with type or light printing on the other side. Deficiency in opacity is responsible for "show-through" of the printing which interferes with legibility and also causes a bad general appearance of the work. Lack of opacity causing "show-through" should not be confused with strike-through caused by too deep penetration of the oil vehicle of the ink into the paper fibers, causing the printing to become visible from the opposite side of the sheet.

There are many factors which affect the opacity of paper: the type of pulp; the degree of beating; sizing, such as starch and glue; mineral fillers; loading materials; and manufacturing operations such as calendering have a bearing upon the opacity of the sheet. Because of the short fibers of soda pulp and its high scattering power and ability to resist hydration, this pulp is used for opacifying printing papers, such as machine finish and supercalendered book papers. The addition of mineral fillers such as clay, chalk, and titanium dioxide increases the opacity of the sheet. Titanium dioxide is particularly effective in increasing opacity. The utility of printing, writing, and bond papers is, therefore, enhanced by high opacity.

Thickness

Paper thickness may be defined as the distance between two parallel plane surfaces pressed with a given pressure against opposite side of a paper specimen consisting of a single sheet or a stack of several sheets.

Uniform paper thickness is essential for good printing. Variation in thickness of paper results in variations in blackness or color intensity of the inks and interferes with the consistent printing quality of the sheet. It is readily seen that if the press makeready is prepared for a certain thickness of paper, a thicker sheet, in passing through the press, will receive a greater degree of impression and will not, therefore, result in the proper tonal value of the printing. It would also

tend to force the type into the sheet and produce an embossed effect on its reverse side. This heavier impression may also cause "strike-through" by forcing the ink deeper into the paper. If the press makeready is for a thick paper, any thinner paper will receive a lighter impression.

Thickness of book paper is of paramount important in controlling the bulk of the finished book. Individual volumes of a set of books printed on the same grade and weight of paper and containing the same number of pages are required to have the same bulk.

Index paper must not exceed the specified thickness in order to economize filing space.

Thickness of U. S. postal card paper is important in relation to the printing and production operations.

Tabulating card paper must be made with exacting thickness, within the tolerance specified, in order to function properly in the tabulating machines which are adjusted for exact feeding and sorting.

Moisture Content

Moisture content is the percentage of water in paper or paperboard. Paper being composed of minute vegetable fibers contains an essential proportion of water. An absolutely dry paper, deprived of its natural moisture content, is brittle and breaks readily. Bone dry paper is, therefore, unsatisfactory for use. Paper is hygroscopic; that is, it is susceptible to humidity changes. It absorbs or gives up moisture with every change in the amount of water vapor in the air. Determination of moisture content should, therefore, be carefully made to obtain accurate results.

The measurement and control of the moisture content of paper, particularly that intended for multicolor work, is essential in the production of quality printing. Moisture should be determined for the control of register, static, cockling, creasing, and curling.

Paper should be ordered from the mill with a slightly higher moisture content than that of the pressroom air. Lithographers with no special paper conditioning equipment should specify a moisture content of 0.5 to 1.0 percent above equilibrium of the usual pressroom humidity for their printing papers.

Formation

Formation has been defined as the uniformity with which the paper fibers and other solid components of the sheet are distributed. It concerns the appearance of the sheet when viewed by transmitted light. This property is very important not only because of its influence on the appearance of the sheet, but because it influences the values and uniformity of values of nearly all other properties.

Paper is said to have a uniform or close formation when the fibers are so evenly distributed throughout the sheet that when it is viewed through transmitted light it has the appearance of approaching the uniform texture of ground glass. The condition of the stock, the traveling speed of the wire on the paper-making machine, and the degree and uniformity of shake, influence paper-formation. A well dispersed stock generally produces a closed formation. A poor or "wild" formation is caused when the fibers are unevenly distributed, giving to the paper a mottled, streaked or "curdled milk" appearance. A flocculated stock has a tendency to produce a "wild" formation.

A closed and uniform formation is an essential item in good printing papers. Without this, regardless of other paper qualities, only inferior printing can be done. An open or "wild" formation, as it is normally called, will result in a spotted variation in thickness and is often attended by thick and thin as well as hard and soft spots. No amount of makeready can overcome this defect. The denser spots where the fibers have clumped together, will act as "bearers" on the printing plate and reduce the printing pressure on the thin spots. When this is the case, the ink will be unevenly transferred and unevenly absorbed, resulting in a mottled and spotty appearance of the printing. Even if the printing pressure is increased to the point of embossing the sheet or crocking the plates, it will not overcome such a fault in the construction of the paper.

Poor formation also causes serious loss of opacity, resulting in "show-through" of the printing on the other side. Because of the nature of their intended use, a "wild" or open formation is desirable in certain absorbent papers such as in toweling and paper-base plastics.

Color

Color in the paper and printing industries is considered chiefly from physical rather than psychological aspects. The basis of color is light consisting of waves which spread out from the source in all directions. The color of the sheet, therefore, depends upon its spectral reflectance as compared with a standard when illuminated with a specific illuminant and viewed under definite conditions. Paper is said to be white when it reflects light non-selectively and absorbs no color. Commercial white papers vary in shade such as blue-white, cream-white, natural-white, etc. They do not reflect all components of white light in the same ratio.

In paper specifications color is generally referred to simply as "color" such as white, green, blue, pink, buff, and must match a selected standard.

Variation in color of book paper, writing, bond and ledger papers is not only encountered among shipments from different contractors, but sometimes occurs within the same shipment. The difficulties which arise from variation in color of paper, cannot be corrected or allowance made for such variation in the pressroom. On a long-run job, it is sometimes necessary to supply the pressroom with paper taken from different shipments. If the color of successive lots of paper differs somewhat during the press run and the ink remains the same, there will be a variation in the tone value of the printed page, since the ink formula and its tonal quality have previously been adjusted to the color of the paper first used. This objection becomes a very strong one when the paper deliveries cannot be segregated to individual jobs, but must be used in large edition runs.

Permanency of color is of paramount importance in cover paper and wrappers of merchandised products put up in packages of distinctive colors.

General Appearance

One of the most objectionable features of paper is an unsatisfactory general appearance due to the inclusion of dirt. The term "dirt" may be applied to any foreign material embedded in the sheet. Microscopic examination of dirt generally found in paper reveals that it consists of black mineral and resinous specks, bark specks, shives, pieces of wood, rubber, wool hairs, color spots from undissolved dyes, oil, grease and wax spots.

Metallic particles have often been found embedded in the paper. They probably arise from wear of some part of the manufacturing equipment such as the wire screen of the paper machine or particles from the beater roll. An unsatisfactory general appearance of paper surface may also be occasioned by crush during the calendering process, thus producing a variegated surface and giving to the paper a mottled appearance, or it may be due to the presence of slime spots, calender marks, colored fibers or even to poor fiber formation during the manufacture of the sheet. The presence of even minute particles of dirt, scarcely discernible by the eye, affects the utility of the paper. It destroys the effectiveness of good printing and this is particularly degrading to the highlight effects in halftones. Gritty particles of dirt wear down the copper printing plates and halftones. In rotogravure printing, they scratch the polished non-printing surface of the copper cylinder, causing fine hairlines to be printed in the non-printing areas.

Wrapping papers used for packaging foodstuffs must be free from foreign particles to avoid possible contamination. Dirt in fine writing, bond, ledger and index papers produces an unsatisfactory appearance which affects their sales.

Conclusion

Printability is not a solo property of paper, but a property of conditions. Printability cannot be entirely built into the paper by the manufacturer. It results from a proper correspondence of certain requiremetns of the printing process, the kind of ink, and the paper itself.

Ramblings of a Tissue Mill Superintendent

By

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The older I get the more I realize that a man never ceases to learn and to profit by drawing on the experience of others. And, while I am deeply flattered to be a speaker here today, I am a little apprehensive also because I am talking to the best men in our business. But if what I say does not agree with your own findings or practices you will be doing me a kindness if you will withhold judgment until we have threshed out the disputed points.

There was a man who once said that when he was 18 his old man was so ignorant that he couldn't stand having him around.

"But," said the man, "when I got to be 21 I was amazed at how much the old man had learned in three years."

Like that man's father, I hope that I will gain your respect as I ramble on. I have a good chance if you will just remember that this is the case history of just one single tissue mill Superintendent—me.

The purpose of this and other meetings of this convention is the exchange of ideas of interest to the industry, to discuss these ideas and to take them back to our home bases to adapt and apply them to local conditions for the benefit of our employers who sent us here.

For purposes of making a point in this address I may from time to time mention particular equipment by its manufacturer's name. These mentions are intended neither to recommend nor criticize; they are to identify the tools with which I have experience.

If it does nothing more, I hope that this talk will provoke fruitful discussion that is so helpful at sessions of this nature. I have no false modesty about my conclusions. They are, as I have said, one man's experiences and if by tearing them to bits we get fuller understanding then I say, "Let 'er rip."

If a tisue Superintendent had only to make tissue, it would still be a full time job. But in the new complexities of industrial life, the Superintendent must also be an orator, a public relations practitioner, a diplomat in the matter of personnel relations, and a guardian of the health of employes and of the company's property. These chores are today as much a part of our jobs as papermaking and I plan to touch on them briefly before going into the question of tissue.

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Public Relations

It is plain good business for any large company to be both respected and liked by the community in which it is located. Earning and holding this respect is good public relations; losing it, is the reverse.

Since companies are judged, sometimes unfairly, by the actions and the words of every person they employ, the large spotlight is on the Superintendent. You are Mr. Paper Mill and what you say and do is of interest to a great many more people in your town than just your employes and their families. You can ruin the reputation of your company just as surely as you can enhance its standing. It is a tremendous responsibility. In The Diamond Match Company with which I am associated we have modernized our thinking about public relations. We are participating more and more in programs intended to weld the friendship of town for factory.

In our Oswego, N. Y., match plant we recently held an open house to which the whole city was invited. That we were able to accommodate only 4700 visitors was the fault of time running out rather than lack of interest.

This open house was the first the company had held since it opened its doors in Oswego in 1892 and subsequently we were literally flooded with thanks from those who had long wanted to see how a match was made. More important, however, is the noticeable improvement in the feeling of the company for the community.

Twin implements in molding public opinion in your favor are the local radio and the local press. If they are friendly, they will trumpet your good deeds to the world; if they are hostile, they will parade your weaknesses.

All of us are called upon from time to time to give talks before local civic groups and other organizations. This "oratory" can be turned into favorable publicity quite easily. Since you write your own speeches, you can always include matter which places your company in a favorable light; and you can always tell your listeners the things they want to hear about themselves—a formula on which even Dale Carnegie can't improve.

Consider it from this angle: Friends *may* buy your company's products; enemies, *never*. If you will have this in mind at all times you'll find yourself just naturally becoming a good public relations representative for your organization.

Safety Programs and Precautions

I remarked earlier that the Superintendent is the guardian of his employes and his employer's property.

I propose to discuss this important phase of mill operations but I should first like to tell you about a disaster that turned out to be less harmful because of our public relations policies.

As most of you have heard or read, our Plattsburg (N.Y.) mill suffered a most disastrous fire last winter. It was the most spectacular fire that Plattsburg or, for that matter, our section of the state had witnessed in many years. We got headlines and pictures everywhere. It wasn't good news about the company but it certainly was hot news and the newspapers played it accordingly.

When it was all over we got together with the newspapermen and said in substance: "The stories about our fire have all been printed. Our customers read the papers and so they are asking, 'When will Diamond be in operation again? When will we get the goods we want?' How about running a statement from our company saying that there will be no interruption in filling orders and also that we'll continue in business just as if there hadn't been any fire?"

Newspapermen are fair-minded people and so the company statement about the uninterrupted flow of goods was carried by the local press and sent out over two wire services to papers all over the East. The result: We lost no orders. Good public relations had paid off.

We learned a lesson from that fire. The first started in our roll storage room which was not separated from the paper machine room by a fire wall. I am going to tell you, in brief, what that fire taught us to watch for in case of disaster.

1. Be sure the fire pumps are started. Have someone on duty all the time who is familiar with the starting of the fire pumps and whose job is to start the fire pumps in case of fire. Make sure this man does not get sidetracked in the event of a fire but that he goes to the fire pumps first to ascertain that they are performing satisfactorily.

2. Be sure your plant sprinkler shut-off valves are well marked and that a large number of your key personnel know what each valve controls. Sometimes it is advisable to shut off a sprinkler valve during a fire if the water through this valve is being wasted and doing no good. One purpose of control valves in sprinkler systems is to make it possible to shut off water areas where it is being wasted and thus make it available to other areas where it is needed badly.

3. Be sure to maintain good police and good watchman protection around the property during the course of the fire to keep crowds away and to keep people out of the area who have no business there.

4. Maintain a good first aid station and if possible provide this first aid station with a good doctor and a staff of nurses. You never can tell what will happen when men are fighting fire.

5. It is very advisable to maintain a supply of hot food and hot drink for the men while they are working on the fire job.

It is very good practice to have your fire insurance people review thoroughly with you all the areas in the plant, to find out how you would fight a fire. Fire and disaster strike suddenly and give you no time to prepare — except *before* anything happens.

Many plants consider that their safety program and their first aid program are part of personnel relations work. In the smaller plants one person can handle personnel, safety and first aid. In the larger plants it takes more than one individual to handle the separate phases.

We consider safety work and first aid work very closely allied to personnel work and very closely allied to public relations in the community. In the first aid work we employ a company doctor whose principal responsibility is to take care of injured people from our plant, and whose next important duty is to give pre-employment examinations.

To care for the injured, we have found it economical to have a company doctor. It saves time, it is less expensive; he has a better picture of our sickness and accident record than could be had if doctors were selected at random.

In connection with pre-employment examinations, we have very definitely saved money because of the numbers of people applying for employment who have been found to be ailing, and who would have been hired if we had not given them this pre-employment examination. We pay for this examination ourselves so it costs the applicant nothing. However, there have been many cases where we have rejected applicants because they were not physically able to do the type of work for which they were being considered.

Our doctor also teaches first aid, since we believe in expert first aid instruction. We have a nurse on duty the first and second shifts, but on the third shift we use personnel trained in first aid techniques who care for the person until professional assistance takes over.

We have found our standing with the doctors in the community much better since we have an official company doctor. The medical men never were suspicious that we were conducting a clinic in our First Aid Department, but with one of their fellow physicians handling this work for us they no longer have any doubts concerning it.

We employ a full time Safety Engineer who also is in direct charge of the first aid work. The Safety Engineer is not responsible to the Personnel Manager, although their work is very closely interlocked. The two men work very harmoniously together to achieve good housekeeping, good lighting, good guarding, training and instruction in careful and safe habits around the plant, and pre-instruction to the new employee before he goes to work.

One of the important duties of our Safety Engineer is to attend compensation hearings and to check on the procedures which the insurance company follows in these hearings. We find it beneficial to keep closely informed on what goes on and to follow up on all records in connection with these cases. The normal tendency for any insurance company is to carry a substantial reserve on each case so that it does not lose money. This practice means that the insurance premium becomes higher as the reserves are higher. The Safety Engineer watches this situation very carefully and is quite successful in keeping premiums down to a sensible level. This subject is something you might well investigate as we have found it to pay dividends.

Personnel

The matter of plant personnel can be either the most vexatious or the most pleasant of responsibilities. Even in this modern age when personnel problems are delegated to the Personnel Manager or other authority, the Superintendent is still held responsible for both the efficiency and the happiness of everyone in his mill. Management looks to him for smooth and uninterrupted operation, a task that is at times a great deal more difficult than that of keeping machinery in repair.

In our mill, the job is becoming easier. There is an increasing flow of highly trained technicians and scientists from several fine schools, such as the Institute of Paper Chemistry in Wisconsin, and The New York State College of Forestry at Syracuse. We also are getting a more thoroughly trained grade of engineers, mechanics, accountants and maintenance people because of the steadily improved techniques of teaching.

You can classify these men as career men. They've charted a course in a chosen field and they'll stick to it. It is not much of a task to keep them happy because they are generally happy in their work. They are people who are going places.

The great mass of people in any mill are the "hourly workers." At one time, when plants were smaller and life less complicated, the Superintendent was father confessor to each and every one of these employes. Today we have unions with stewards, shop committees, officers and International Representatives—as a result, we don't necessarily deal with individuals but more like with committees. This requirement means that the Superintendent can no longer handle all committee contacts by himself. Rather he must have someone to make these contacts for him, usually the Personnel Manager.

The Personnel Manager occupies an increasingly important position in industry today. It is on his shoulders that the burden rests for keeping a supply of labor available, and for keeping peace in the family in the plants.

The fact that labor is organized in our plants today does not relieve the Superintendent, or Personnel Manager, or, for that matter, any executive from the job of considering the employe as a person and not as a piece of equipment. Probably nothing irritates a worker more than to be ignored. Personal feelings are of the highest importance in human relationships, especially on the job. Fair and really human understanding is more essential than ever.

It is advisable for you, Mr. Superintendent, to spend whatever time you can in talking to people on the job, in listening to their problems, their comments and suggestions, and, especially, their criticisms. You will learn a lot and will benefit. There is a great deal of good common sense among the men and women who make industry tick.

Tissues

It has taken me a long and rambling time to reach the principal task of the tissue Superintendent — the manufacture of tissue.

While tissue was known to the Chinese as long ago as the year 875 A.D. it was not until 1870 that it made its appearance in this country in its familiar roll form. It is relatively new in many of its applications, receiving its greatest impetus just after World War I when facial tissue, sanitary napkins and many more volume uses were created.

Loosely defined, tissue paper is a paper with a basis weight of 15 pounds or less per ream. Immediately you will observe that this definition segregates tissue from other papers when a comparison is made on a tonnage basis. However, manufacturing and equipment problems of tissue are not too greatly unlike comparative problems involved in the production of paper of any heavier weight.

The importance of tissue in the industry is emphasized by its great variety of forms and uses. Great amounts of it are consumed as facial, toilet and wrapping tissue; as carbon and lens tissue; for wrappings for fruits and vegetables; and for a score of other everyday purposes. Its production employs thousands of persons; its uses affect the lives of millions.

Pulp

The raw materials from which tissue is produced are basically unaltered but there are refinements which deserve mention.

Bleaching of groundwood is one of the newest and one of the most important of the refinements. Although practical processes for doing this job were introduced comparatively recently, the bleached product has become very important—especially in view of growing competition and the high prices prevailing in bleached chemical pulps. Bleached groundwood is a filler and is in direct competition to bleached soda pulp, especially as to price.

Another development, very well known but probably becoming more important in our phase of the industry, is bleached kraft. Bleached kraft, no doubt, will be increasingly used in manufacturing tissues where strength requirements are high.

Another new type of pulp, called semi-chemical, also is being developed. There is a plant being built (or is in operation now) at Green Bay, Wisconsin, which will manufacture pulp of this kind. Very little experience data or information on such pulp is available at this time. Possibly, it might be better suited for such grades as light weight waxing tissues than for soft creped tissues. As time progresses and as work is done on this grade, it will become better known and applications for its properties will be found.

A late development in pulp preparation is curlation, a pulp preparation procedure developed in Canada. Very little is known of this procedure at this time except by those people who have used it. The published claims for the pulp, there being a great deal published about it recently in the trade publications, are provocative. No doubt many of you will be checking to see how this type of treatment fits your particular requirements.

A well known type of stock which has been used with great success, especially during the war years, is de-inked waste paper stock. Some mills have been very successful with it. The increased use of wet strength agents makes the selection of waste paper a little more critical. The presence of wet strength agents in the waste paper may be harmful to your operation. Refiners are used to refine de-inked bleached stock — to disperse any remaining traces of ink spots in the stock — with good results, particularly for creped grades.

As to the pulp supply, everyone knows that pulp is plentiful at this time. This abundance makes selective buying possible and gives the consuming mill the pre-war quality-wise and price-wise opportunities, thus assuring the best competitive position.

Recent years have seen developments of pulp breakers of various types, one of the best known being the Hydrapulper. Use of this type of equipment and similar equipment has made the breaking up of dry pulp a different problem than it was prior to their introduction. No longer is hand feeding of sheets necessary to get pulp into slush form. Some pulp breakers will take bales even with the wires left on them. In running such a breaker, it is simply necessary to cut the wires, dump the bales into the unit, and after the pulp is pumped out, remove the wires from the tub. This practice results in great savings in labor.

The modern pulp breaker does just what the name implies. It breaks pulp up into slush form. It does not refine the stock. A number of operators claim that these breakers do refine the stock, but our experience does not show a degree of refinement anywhere near what is necessary. Even the manufacturer who supplied our units pointed out that we must not expect refinement in the breakers. They are intended only for conversion of pulp into slush form from dry form.

If a mill is handling air-dry pulp in bale form for a bleach plant, the stock should be carefully examined as it leaves the breaker and is pumped to the chlorinators or the bleachers. If there are unbleached lumps of stock after the bleaching operation has been carried to completion, it is an indication that the stock should have a light treatment before going to the bleach plant.

At Diamond we are fortunate that we do not presently break up dry pulp. Our pulp comes about half dry and breaks up very readily; so we do not have any trouble on this score. The information, however, is given for those operators who find unbleached lumps of stock in their bleached stock.

The next logical step to discuss is the handling of stock after it is in slush form. This handling requires pumps, piping, and chests.

In recent years, the use of tile lining in stock chests has been extremely beneficial, especially when combined with good agitation. The tendency for slime and pitch formations to accumulate in a well-agitated, tile-lined stock chest is remote. It is recommended for assuring clean stock.

Another improvement in paper mill equipment is in the piping materials. Transite, copper, stainless steel, plastic tubings, glass, and other materials, have greatly improved piping layouts.

An interesting development has been going on recently in some mills. These mills are making their own piping — using stainless steel sheets. We have had no experience with this practice, but it appears to be worth investigating.

Another consideration in the design of a stock system is to make sure there are no dead pockets and no sharp angles on which slime and pitch can accumulate. We have found a corrective for slime and pitch through thorough housecleanings after shutdowns on Sunday morning. Hot water, caustic and Oakite are the basic materials used. Although this procedure takes both money and time, it pays dividends in more continuous and more efficient operation in the week that follows.

This housecleaning starts at the pulp breakers; and goes right through to and includes the entire stock system, the head box and Fourdrinier section on each paper machine, also the save-alls, white-water chest, seal box chest, and any other place where the water gets back into the papermaking system.

One phase of tissue manufacture which has caused a great deal of discussion and argument in our plant is stock preparation. The chief disagreement concerns beating and refining equipment.

In my opinion, both the equipment manufacturer and the operator can be criticized for faulty installations. The basic requisitioning for refining equipment in the plant usually is carried on by such people as the Superintendent, the Engineer, and the Technical Control man. Such men have very definite ideas on what the finished product should be like, but they have many varying ideas on how the stock should be prepared to get that final finished product. Under the circumstances, the selection of the equipment is fraught with a great deal of danger. If the basic requirements are presented improperly to the equipment manufacturer, he has only faulty data with which to work.

It is fair to state that, if the picture is not complete, it is the fault of the people who represent the mill in the discussions with the equipment manufacturer. However, the experiment equipment maker should know that there is a possibility that he doesn't have all of the facts, or that the facts he does have may not be entirely accurate. Therefore, before beginning construction, he should check and recheck.

Mutual lack of knowledge can be blamed for improper recommendations for equipment. To avoid such a situation, some progressive manufacturers are installing laboratories of their own. In these laboratories, they plan to make thorough tests of the problems presented to them so that they do not have to depend on imported facts. Such pre-examination of all questions will eliminate much useless outlay and correct many headaches.

When a Superintendent invests

money in a unit, he is risking his reputation with his employer on the investment. At the same time, the equipment manufacturer risks his reputation on the operation of the equipment. No one can afford to gamble here. There probably has been a great deal of equipment removed from service because of improper first selection. The whole trouble stems from a lack of complete understanding of the initial problem on the part of both the user and the manufacturer.

Just to illustrate: I know of an installation which was criticized very severely when first started. The selection of the unit was based on the conclusions resulting from a carefully conducted investigation on the operations and experiences of other mills with the same type of equipment. Comparisons also were made with competitive equipment before deciding upon the unit in question.

The order for the equipment was placed, the installation made, and the unit started. It did not perform well; in fact, it performed very badly. Investigation revealed that the unit was not exactly like the design agreed upon. The builder's intentions had been perfectly good; but the fact remains that the accepted design had been altered. The machine as installed was different from the machine actually ordered. Now, if you were the Superintendent in this case, how would you feel about it?

It is my opinion that the purchaser of this machine had ample reason to remove it from the mill, send it back to the manufacturer, and recover damages for all loss of production and other expense. The purchaser, however, was not in position to act in this manner. The machine was needed; and it did operate well enough at the first to allow the mill to get by.

Equipment manufacturers try their level best to get their equipment to perform. They cannot afford to do otherwise.

After two or three months, with adjustments and changes, the unit squared itself away and started to perform satisfactorily. So far as I know it is still installed, and is performing satisfactorily.

The irony of the whole situation is that all of this trouble could have been avoided had the equipment manufacturer provided a unit exactly like those which had been investigated or had the Superintendent in placing the order made himself unmistakably understood.

I don't think a Superintendent is to blame if he is placed in such a position as this situation reveals, but would his company understand? To make sure, you must present your case fully and accurately. You must see to it that the equipment manufacturer's representative has analyzed the case fully and accurately, and that the joint decision of your engineers, technical men, operators, and yourself is the best. Such exact attention to details will save a great many headaches.

Returning to the question of refining units, there are a number of good makes. Considerable progress has been made in recent years in the design of the several disc refiners on the market. Jordans have had a tendency to go to small sizes with higher speeds.

A unit which has received a considerable amount of attention recently is the Morden Stockmaker. This unit seems to have been applied more extensively to machines making such grades as glassine, waxing, and the higher finished transparent sheets than to other grades. There probably are some installations on creped tissues, but I don't know of any.

The Claflin refiner also is regarded as a good unit. It is being widely used in mills which I have visited. Claflin operators have spoken very commendably of its performances.

There has been a great deal of discussion on how a jordan should be put into the stock system. On one of our machines, which makes soft creped tissue, is a No. 2 Jones direct-connected to a 75 h.p. motor. This jordan works slightly under pressure. In other words, the stock is put through it under pressure. The tonnage at present is around 35 tons in 24 hours.

The jordan motor probably draws 65 h.p. at the most. Actually there probably is no more than 25 to 30 h.p. being applied to the stock itself; the rest, possibly being lost through friction and other causes.

The small amount of power required on the jordan shaft was interesting to us. We had originally expected higher power requirements.

This jordan has proven itself in service. We are extremely glad that we put it in as a trial unit before going to a more expensive and higher powered job.

Soft crepe tissue mills in general tend to go to the smaller high speed type of jordans or refiners. Certainly they are easy to install, and each individual unit doesn't cost too much. It also is not prohibitive to have more than one on a machine in case of trouble.

Last year, when putting in our new soft crepe tissue machine, we installed a new unit in the screening position. This particular unit is a Selectifier made by Shartle Bros.

The Selectifier consists essentially of a stationary tub in which is installed a perforated circular plate with a set of revolvable blades on the inside. The revolving of these blades gives motion to the stock which passes through the perforations in the plate.

Accepted stock goes through the perforations; rejected stock goes down and out through a reject unit. The reject unit can be set so that it will discharge at any desired time interval. The amount of material coming out of this reject unit is very small and the pulp lost through it cannot be very great.

We plan to flow the discharge into a riffler to see what it amounts to; but I don't believe it will prove worth saving.

So far as our installation is concerned, the Selectifier is not a screen in the sense that it will take out fine dirt. We do not intend it to take out the fine dirt as a Bird screen or a flat screen or some similar type of screen. We simply want it to break up any lumps and take out foreign matter such as wire, nails, screws, stones, string, etc.

The perforations in the circular plate of Selectifier can be obtained in a range of sizes. The larger the perforations, the more a unit will handle. At present we are handling up to 35 tons a day through our unit at a consistence of around 3/10 of 1 percent.

If you plan to discuss such an installation with the manufacturer, carefully determine the amount of water you are going to handle. The capacity of a unit is determined by the quantity of water that can pass through the perforations.

On another paper machine, where we want to take out fine dirt, we have a Bird screen. It is our plan to install Dirtec units on this screen. We are interested in seeing them work for us.

Comments from the trade have been very favorable on such stock cleaning units as the Dirtec and Vortrap.

We have not operated the new machine long enough to learn much about the operation of its head box and the slice. However, when considering a new head box or a new slice, and especially if considering a new machine, be sure to allow yourself ample width of slice. Without an operating record for a check, it is very difficult to know how much shrinkage the sheet takes going from the slice to the reel.

One of the critical operating problems at the slice is the formation of good edges. We use fan type showers on the wire to clean off any improperly formed edge. The better the edges are formed the less the trouble as the paper goes through a machine.

Going back to the Selectifier in our installation, we like it because the water does not cascade out into the open. It goes directly from the wire pit into a fan pump with the stock being introduced to the water just ahead of the pump. The stock then flows through a completely closed pipe system to the Selectifier and from the Selectifier to and through the head box arrangement. This design keeps out much of the entrained air which occurs when water cascades from the discharge end of the open screen.

Maintenance of a High-Speed Modern Paper Machine

By
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The maintenance problem on a modern high speed machine is basically the same as on the old style slow speed machine; but, as the initial investment and the productive rate increases, the losses due to down time also increase until on the big producers they begin to seem like the national debt. We are therefore justified in a greater investment of care and expense in holding this down time to a minimum. The difficulty in these days is to prove the necessity of this outlay, since this saving doesn't show on the record. You can't prove that you would have lost an hour's production if you hadn't oiled a lineshaft bearing on a certain day. And a bad breakdown is not such a hot way of proving your point.

Records

A modern mill is too complicated to keep everything under one's hat, so that a good record system should be set up.

A system should be set up for routine inspection, so that all wearing parts will be checked at predetermined intervals. The Kardex System with date tabs is very satisfactory for this purpose. Separate systems are required for lubrication, for instruments, electrical equipmeint, piping, etc., depending upon how responsibility is divided.

A record should be kept of the various component parts of the machine such as clutches, shakes, steam fits, motors, bearings, etc. and the cost of maintenance should be posted on these records as well as the troubles being experienced with them. These records should be analyzed to determine if any part is giving excessive trouble. If so, the part may be improperly designed or applied, and steps should be taken to correct it; or possibly it is worn out and should be replaced rather than be repaired; then again it may not be properly serviced or handled. These records should show the general specifications and locations of the parts. It is also a good idea to show the symbol of spare repair parts carried in stock for them. Crown information and rubber covering of the rolls can also be included on these records.

Spare Parts

An adequate stock of repairs for the vital wearing parts of the machine should be maintained. Bearings, clutch plates, shake springs, steam fits, motors, etc. should be included. Replacements should be ordered automatically as required. Where a number of parts are required such as steam fit carbons a maximum minimum stock requirement should be set up. Although such a parts stock is necessary, it is very easy for an ambitious stock clerk to run wild and a firm hand is required here to keep the money tied up in stock to a minimum consitsent with good service.

It is almost an impossible job to keep the machine up in A-Number-1 condition by only taking advantage of wire and felt changes and a good piece of equipment deserves good care. You expect a machine to give long years of trouble free service and you should give it half a break. Therefore, the machine should be thoroughly overhauled once, or better still, twice a year. At this time the whole machine can be checked into, all rolls reground, all worn parts replaced, and the machine cleaned up, rechecked for alignment and repainted.

The three worst enemies of a machine are corrosion, poor lubrication, and misalignment.

The manufacturer does his best to keep the corrosion problem to a minimum. Most of the parts that come in contact with the stock are protected with stainless steel, brass or rubber. Economics limit him in this and there is still plenty of cast iron and steel in the machine which must be protected with paint. A great deal of experimentation has been done recently with synthetic resin and rubber paints and it would be well to investigate their application around the wet end of the machine.

Alignment

Many failures of bearings, gears and couplings have been blamed on design which are actually caused by misalignment. If you have coupling failures, always check for alignment, a flexible coupling isn't a universal joint. If you have trouble with a rubber covered press roll, check alignment, maybe it's cocked giving a heavy nip at the center and scuffing at the edges or maybe the doctor isn't lined up right. Many felt troubles can be traced to misalignment. Excessive wear in gears may also be due to the same cause. When in doubt always check alignment first.

Lubrication

Books have been written on lubrication alone and it would be impossible to cover the subject here. Experience has taught us all the importance of proper lubrication properly applied. The manufacturer will recommend the type of oil or grease to be used on the different bearings and how often they should be serviced.

Most bearings in the modern high speed machine are of the anti-friction type. The balls or rollers in these bearings theoretically have a point or line contact. Actually there is some deformation of the raceways and balls under pressure so there is a continual deformation of these parts which eventually causes metal fatigue. Due to proper design this fatigue point will come only after a very long period of trouble free service, but remember that bearings do not last forever. This fatigue is first indicated by flaking of the metal of the raceways. If you find this condition in time on inspection you can rotate the bottom raceways to change the presure point and salvage the bearing. Oil film spreads the contact between the balls and raceways and increases the effective contact area so there is less deformation of the metal, and also provides the film to decrease wear. Another function of the oil should be to prevent corrosion. If you are troubled with bearing failures therefore look first for misalignment or poor lubrication, as most failures are due to one of these two causes.

Dryer bearings give the most trouble since they are subject to high heat, moisture may be present due to condensation and steam leaks and dirt and paper dust may be drawn in under some conditions. It is accepted practice to lubricate them with a continuous oil circulating system. The housings must be designed so that plenty of oil is circulated to flush out the housings, carry away impurities and keep the wearing surface temperature below the breakdown point of the oil. The oil chosen must not only be suitable to stand up under the imposed pressures and temperatures and to carry away any dirt formed, but must also protect the bearing from corrosion. Select the best oil available for the purpose and check it often to be sure it is not deteriorating. Check the bearings often both for corrosion and wear and if there is any indication of trouble, take immediate steps to correct it. In a well lubricated bearing all surfaces of the rollers and races, and inner surfaces of the housings should be entirely free of rust, sludge, carbon, and scale. If there are oil pockets in the housings drain them regularly to see if there is any water present which is an active cause of corrosion trouble. I want to emphasize again that most of the fail-

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ures are due to improper lubrication rather than to defective or undersize bearings.

Fourdrinier

Probably the best indication of the mechanical condition of the fourdrinier is the wire life. A short wire life usually means increased friction. As usual, first check alignment of all parts. Are the rolls true or have they developed flat spots at low edges and need regrinding? Do they turn easily on their bearings? Are the flat box covers in good shape? Do you graduate the vacuum on them to keep it comparatively low on the first boxes so as to get the maximum use out of them with the least possible drag? Perhaps some of the rolls have become too thin and have too much deflection or have got out of balance and tend to jump. Don't let stock accumulate on the wire rolls, they should be doctored or showered depending on their position in the machine to prevent this. The wire life is also shortened if there is grit in the water. If the system is entirely closed chemical concentrations will build up which sometimes attack the wire.

Suction Rolls

The manufacturer's instructions for the care of suction rolls should be followed closely. If the roll squeaks when running a special shower can be installed. Move the end deckles in and out once a week to clean the sealing surfaces. Wash out the holes whenever you shut the machine down and when the sheet is off the machine by means of the sealing shower so that the stock left in them won't dry out. The roll should be dismantled and thoroughly checked at least once a year. If the shell is badly scored, it should be repaired.

Always inspect the holes in the suction rolls to be sure they are clean. With some kinds of furnish they tend to plug up and decrease the efficiency accordingly. Therefore, a schedule for cleaning them should be inaugurated. For most types of stock, suction press roll cleaners as made by some chemical companies are very satisfactory. Plug the outlet from the saveall and run in enough solution at the recommended temperatures to cover the thickness of the shell, then revolve the roll slowly in the solution until the deposit is loosened. Rinse in the same manner with clean water of the same temperature, then reduce the temperature slowly by adding cold water.

Press Section

Check the felt rolls for alignment, smoothness and balance as you did in the fourdrinier. Use a guide that is not hard on the edge of the felt. We have found the air operated guide very satisfactory for this application. It works smoothly and quickly. Check the felt conditoner to be sure you are not using more water or more vacuum than necessary. Don't have the water too hot—in most cases around 110°F. Be sure the shoes are lined up parallel with the felt run and not in excessive contact with the felt and that they have no sharp edges.

The amount of crown in the press rolls is extremely important. Overweighting of one side of a press roll to correct for an incorrect crown is a poor substitute for proper crowning at the best and is hard on the sheet and on the cover. It also greatly decreases felt life. If the sheet comes out of the press with wet streaks, it may be an indication that the crown is off and the roll should be reground. The amount of crown for a given press nip can be calculated theoretically, but this can be only approximate due to the number of variables involved. To check this crown take a nip impression; raise the top roll and lay a piece of adding machine carbon paper face up on the bottom roll then another paper over the carbon and hold them in place with scotch tape. Lower the top roll carefully in place being sure to keep both ends even, then weight it at the same pressure at which you run; raise the top roll again carefully and look at your nip impression. If it is wider in the middle than the ends you have too much crown and vice versa. To get the longest rubber life the crowns in the two rolls should be in proportion to their diameters as this gives the least working of the rubber.

Example

For example assume you have two press rolls, one 30″ diameter and one 40″ diameter with a total crown of .040″ diametric; your nip impression is one and one-half inches wide at each end and two inches in the middle. This indicates that the crown is too great. They should be recrowned in proportion to 2:1½ or .030 in. total crown. The 30″ roll should be crowned 30/70 of .030 or .017 and the 40″ roll 40/70 of .040″ or .023″.

Rubber covered rolls should be stored where possible in a cool, dark, damp room. They may be kept in their shipping cases supported on their journals wrapped with paper to keep out dirt and covered to prevent damage. The journals should be protected with an efficient rust preventative. Rotate the roll every few months. Do not grind until just before using as the surface becomes oxidized and hard during storage and sometimes surface cracks develop. This is especially true of soft rolls.

Dryer Section

The paper dryers are designed for a given maximum steam pressure and you should be sure not to exceed this design pressure. The dryer bearings have already been discussed.

In the felt run we have the same problems as the felt run in the press section, that is, you should watch your rolls for smoothness, deflection and alignment. You also have to watch your rope carrier equipment for alignment. The sheaves should be positioned so that rope runs on the axis to keep it from wearing.

The steam fits require constant attention as a leaking steam fit not only causes loss of steam, but this steam is likely to get into the bearings and cause trouble and also decreases the drying efficiency of the machine. Be sure they are adjusted properly. One of the greatest enemies of steam fits and piping is super heat. The carbons will cut out very quickly if you have excessive super heat and the brass sylphons and expansion joints are also injured. With super heat you have more trouble with the steam piping and steam joints. We now have steam fits so designed that the carbons and sylphons can be installed on the run so that it is not necessary to have a dryer off the line for any considerable period of time between shutdowns if trouble occurs with a steam fit.

If the condensate is not evacuated properly out of the dryer, not only will the heat transfer through the dryer be adversely affected, but the power requirements are greatly increased. This may in turn cause failures of inshafts, clutches or even dryer gears. There should be approximately a 3 lb. differential between the steam header and the condensate header in order to properly evacuate the water. This should be checked and you should also occasionally check the condition of the parts in the dryer to be sure that they are in good condition. If you begin to have trouble with your drives to the dryer section, one of the first things to do, is to check up and to be sure that the dryers are not water logged. Turn off the steam when you stop the dryer section for a short while in order to keep it from water logging.

Another source of trouble are the dryer doctors. Although it is necessary to keep the surface of the rolls clean, you should not leave the doctors down any more than possible as they take considerable additional power. Where the doctors must be left down continuously they may be oscillated. Check the doctors for alignment, prevent chatter, keep the mountings tight.

The dryer gears are usually enclosed in a high speed machine and these should be inspected from time to time to be sure that the oil is being properly applied.

Calenders

For large high speed machines we prefer the open side calender stack because, among other reasons, the rolls are so easy to change. On a heavy weight sheet where you are only using a few nips you can thread the sheet through the upper rolls then lift them to keep these rolls clean and polished. These rolls should be inspected frequently and any marked roll replaced immediately, since if it is left in the stack the marks will be transferred to the other rolls. When grinding a pitted roll, get below the pit or it will reappear. Watch the crowns on your bottom and top rolls to be sure they are

correct for the sheet you are making. Spare rolls should be cleaned with kerosene, protected with a good rust preventative and stored resting on their journals. Rotate them occasionally.

Reels

The main thing to watch in reels is alignment. Try to get the men to treat the spools as pieces of precision machinery—which they are—and not like a piece of scrap iron. Make a rack for storing spare spools and babbitt the inside of the crane hooks.

Drives

The maintenance of electric sectional drives really should be discussed by an electronic engineer and I won't attempt even to touch on them here; but will only consider the mechanical drive. The pulleys should have a wide face and small taper for the best belt life. The belting should be of ample size and carefully glued to be sure it runs true. A crooked belt is one of the most common causes of trouble. By use of infra red ray equipment, belts can be spliced in a very short time. Inspect the belts often and keep them in good shape both as to splices and edges.

Follow the manufacturer's instructions for the care of the gear units and inspect them at reasonable intervals particularly for lubrication.

The clutches in the newer designs of drives safeguard the operator against throwing a clutch in too hard, especially in a dryer section. This is not true in the older installations. The starting load may be terrific and it should be taken up in clutch slippage rather than in squealing belts or broken inshafts. The clutch must be adjusted from time to time to correct for the wear on the plates and the plates replaced when necessary. The clutch should not slip after the machine has come up to speed; if slippage occurs the clutch must be overhauled at once or some overload condition, such as waterlogged dryers or improperly adjusted steam fits, corrected.

Air controls are used extensively throughout the machine. We use air rather than water because it is elastic and the cylinder or diaphragm will have some give to it in case something goes wrong, as for example, a lump going through a press nip. Let's keep it that way and not let the system fill up with water. A separate compressor is preferable to mill air for control service since you can then keep a constant pressure available, while the more mill air you furnish the more the operators will use. Install a large separator tank after the compressor to get rid of the moisture. It is also a good thing to have a filter and separator ahead of each air control system and a lubricator ahead of each cylinder and air motor. Copper tubing is quicker to install than pipe for the air lines and will remain clean. Be sure that water is running through all water cooled brakes at all times.

Power Plant Maintenance

By

W. P. JORDAN

Manager, Engineering and Maintenance—Ecusta Paper Corp., Pisgah Forest, N. C.

We all know that downtime on our production equipment in the paper industry must be held to an absolute minimum, if we expect our production equipment to operate at its maximum economic efficiency. In the plants of this industry, the production facilities demand on our power generation equipment is not only for operating power, but primarily for process steam, and as a result of this, the importance of keeping our power plants operating efficiently with a minimum of downtime becomes of paramount importance.

I should possibly discuss the principal causes of breakdowns and maintenance of power equipment, such as the overloading of equipment or excessive accumulation of ash and slag on the heating surfaces, but the cause of breakdowns are well known to all power plant operators.

The proper methods of repair of equipment is also known so that this to my mind is not something for discussion at this time.

For a number of years this association and the various other associations that we belong to have stressed more and more, the importance of a preventive maintenance program, and the majority of you are thoroughly familiar of what preventive maintenance consists. Now when talking about power plant maintenance, a preventive maintenance program becomes more important than ever.

Large items of maintenance on power generating equipment in the majority of mills must be scheduled to conform with the demands of the production department, and as a result of this, it is necessary that a maintenance schedule for power plant equipment must be established and strictly adherred to, more than in any other department in a paper mill. Actually, in my opinion, a maintenance program for power plants is very similar in most instances to a preventive maintenance program in any other department in a paper mill, with the exception that opportunities for complete overhaul are limited. As a result of this, it is necessary that all equipment in our power plants must be kept operating as efficiently and kept in as good a condition as possible in periods between scheduled shutdowns.

I am sure that you will agree that downtime and repairs are a definite result of the manner in which our installed equipment is handled and operated.

This being true, I believe that it behooves all of us to set up a definite procedure for operation and regular inspection of the various equipment in our power houses.

In order to do this, we must know what the equipment is doing, how it is operating, and whether a certain item will shortly need repairs.

In order for the managing staff of the power plant to do this, they must have records, or in other words, a complete up to date history of all his operating equipment.

No one can deny that the backbone of a preventive maintenance system is actually information compiled on the performance and conditions of equipment.

In order to compile such information, it is necessary that strict inspection schedules of every piece of equipment in our power plants be established. Setting up an inspection schedule for maintenance purposes, in my opinion, must first be started by setting up a record of all equipment which is within the power plant. This would be an inventory of all operating machinery and its necessary auxiliary equipment which would be as complete an inventory as carried by the Accounting department. This equipment inventory would list the name and type of machine, its function, the manufacturer, serial number, and other pertinent data that will clearly identify every piece of equipment and its component parts that you intend to maintain or cover in periodic maintenance repairs. From this equipment inventory, can be made a record, preferably a card record, on which over a period of time, you can accumulate maintenance and repair data, from which information and experience can be gained to set up a definite inspection schedule.

It is not possible to say how often a certain piece of machinery should be inspected or checked without some knowledge of what its past performance has been.

In the beginning machinery cannot be inspected too often and if the proper records are kept on the equipment inventory of all repairs and replacements, a schedule can soon be arrived at which will tell us whether a piece of machinery should be checked once per shift, once per day, or over a greater period of time, sometimes lasting for a year or more.

The person in charge of operating

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the power plant, after determining from his records of inspection periods for various pieces of equipment should then work out a regular inspection chart or have an inspection schedule become a part of the daily operating log with the piece of equipment which requires frequent inspection listed on this inspection chart or daily log sheet.

In the majority of power plants, it is not economically feasible to have a crew of men or a man even for the specific purpose of devoting his full time to inspecting and maintaining the power plant equipment, and also recording on the proper form the results of such an inspection.

As a result of this, it usually falls upon the power plant supervisor or manager and the operators and workers within the power department to maintain an inspection record of the equipment.

It should then be the duty of the operator to make a complete inspection of the items indicated by the chart, and make an indication on the chart that the equipment is operating satisfactorily, or if it is not, make whatever comments are necessary and report these to his supervisor immediately.

If this is done, the manager of the power plant will know that the equipment is operating satisfactorily, and efficiently, at all times, or he will know when any needed adjustments or repairs are needed which can then be done by the regular mill maintenance crew or deferred to a later date.

To have the operators make an inspection on this equipment should not be a hard job to do within a power plant, since as we know, the operation of these plants are continuous and in most cases today, fully automatic. As a result of this, it sometimes becomes difficult for the manager to keep the workers occupied during their particular shift, particularly on those shifts where there is no supervision.

Knowing this, it is possible for the supervisor of the power plant in conjunction with the inspection schedule, from which after a period of time he can determine how much time regular inspections will require, to then also assign various other specific duties for the men to perform during their regular shifts of a preventive maintenance nature. This could include small painting jobs, changing filters, and general housekeeping work, which would include house cleaning in remote spots within the power house itself, which would not ordinarily be visited by workmen. This would provide a great value in keeping workmen busy, and also in locating trouble in remote areas, as a result of the men being sent to remote spots at periodic intervals in accordance with a definite schedule, provided the operators themselves are trained to always look for trouble when performing such duties.

From the daily inspection chart or log sheet, the supervisor of the power plant can make up a memorandum of detailed maintenance work which is necessary to be done in order to keep the plant operating at maximum efficiency. From this detailed maintenance memorandum, he will be able to have the work done which is necessary immediately, or he can compile a list of the maintenance work which can only necessarily be done during a periodic complete shutdown on power generating equipment. If such a record is kept up to date, and followed religiously, the supervisor of the power plant can at all times tell immediately exactly what condition all of his equipment is in, and what needs repairs and whether it has been repaired or not.

Another important phase of preventive maintenance which cannot be stressed too highly, particularly in power plants, is that of seeing that all of the equipment is properly lubricated, and that the lubricants at all times conform to required specifications for their particular applications.

This is one phase of preventive maintenance that must of a necessity be carried on by a workman specifically assigned to this duty. He must be held fully responsible for the proper execution of these duties.

These duties should not only include the application of the proper lubricant at the proper time, but also the keeping of a regular lubricating chart which will show where a particular piece of equipment requires lubricating, and that it has been lubricated.

It is of extreme importance that regular schedules shall be set up for testing and checking the condition of the oil in turbine lubrication systems, and also in checking the oil pump and filtering systems with which all of our modern turbines are equipped.

Modern and up to date power equipment is designed now to give many years of trouble free operation with a minimum amount of repair and maintenance work.

That modern equipment will operate in this manner will also be proven from our daily or periodic inspection charts. However, even though the equipment seems to be in good operating condition and running satisfactorily, it would not be wise to continuously operate this equipment without at some specified interval looking on the inside of the equipment so that we know exactly what its condition is.

As an example, we believe that in spite of what our inspection chart shows, that our turbines should not be allowed to operate for more than a two year period without it being completely dismantled.

In order to open up equipment, a definite schedule must be worked out for a periodic shutdown of the power plant which, of course, would have to be tied in with the demands of the production department.

This periodic shutdown should be strictly adherred to, and should have the complete support of the mill management, for only in this way can management be assured of obtaining the maximum life span of any piece of equipment. At such times as large pieces of equipment, such as the turbines and boilers, are dismantled, they should be inspected not only by our own maintenance employees and supervisors, but also by representatives of the manufacturer, and such other consultants as may be retained by your particular company for advice in the proper operation of your power plant. To properly carry out a scheduled shutdown of the power plant equipment as mentioned above, and so that this scheduled shutdown will be of as short duration as possible, it will, of course, be necessary that the supervisor of the power plant to have compiled from his inspection records a definite list of maintenance work which was scheduled for this shutdown.

Also, he should have compiled, in addition, the various other items of preventive maintenance which should be performed at this time, such as cleaning interiors of the turbines and boilers and checking those various items which are unable to be seen while the power plant is in operation.

We all know that the most important parts of the boilers and turbines are in the interior.

We know that the proper maintenance of boilers and turbines internally is the prevention of corrosion and erosion, the prevention of scale and other deposits, and that this in turn, is a matter of proper treatment of the feed water and boiler water.

Both turbines and boilers should be inspected at frequent intervals until you are positive that the feedwater treatment and control is adequate to permit long period of operation without shutdowns.

I have mentioned the treatment of water for it plays a most important part in increasing life and maintaining efficiency in the power plant.

It is doubtful if there are a great number of mills who have the men and equipment to properly answer the many complex questions on this subject, and I think it would be a wise move to investigate the retaining of one of the recognized consultants in this field.

It is not always easy to justify this economically at the outset, but it is something that will prove to be advantageous in the long run for proper water treatment is just as much a part of preventive maintenance as proper lubrication of a bearing.

In most of our modern power plants today, there is a multiplicity of meters and instruments that tell us whether our power plant equipment is operating at its maximum efficiency. Needless to say, it is absolutely necessary that these instruments also be main-

tained in first class condition at all times or their value to a power plant becomes completely negligible.

It is our belief that the operation and maintenance of these particular instruments is of such a specialized nature that it, just as much as the lubrication, should be under the responsibility of persons other than operators in the power plant.

In our own plant, we have a regularly assigned meter department crew, whose responsibility it is to see that the meters are maintained properly. The men who are in this department and who have the responsibility of maintaining these particular items of equipment have been thoroughly trained in their work, even to the extent of attending training schools that are sponsored by the various instrument companies.

In addition to actually maintaining the meters, it is also the responsibility of the Meter Department to keep an equipment record, inspection schedule, just as much as in the power department itself.

I have mentioned before that we should have an equipment inventory on all machinery and equipment in our power plants, and that this record should have on it the history of any repairs or replacements made on any specific piece of machinery. If this particular record is properly kept, you will have complete information showing what parts were necessary to be repaired or replaced, the length of service, or life which was obtained from the part of equipment which was replaced or repaired. From this record, you can readily determine your spare parts storage.

Certainly all maintenance work in power plants could be speeded up considerably if our storage of spare parts were kept up to an absolute maximum, but in many cases, this is not economically feasible. It is not possible to apply a definite rule to any one plant, as to how many spare parts one should carry but from the equipment record showing the downtime and repairs necessary on the equipment one can determine what minimum spare parts should be carried in order to minimize any downtime due to breakage.

As I have said before, the stock of spare parts which one should carry in all cases be based upon past records. We all know that spare parts of any nature are only a form of insurance against loss of production, and a wise management will certainly not pay an excessive rate for insurance, and so in all cases, spare parts should always be based upon the statistics we have kept upon the operation and performance of the particular machine.

A record should be maintained by the power plant management as to just what spare parts are carried for his department, and this record should be kept up to date.

That is, all usage of spare parts should be recorded so that it can be determined if the stock of spare parts is too low or too great.

Most equipment manufacturers will recommend items that should be carried but their recommendations must always be tempered by other factors such as the location of your mill, and as a result the immediate availability of repair parts.

Over a period of time, your equipment record along with your spare parts record will show what is the most economical number of parts to carry in storage.

The real crux of this paper is not to tell how or when to service any particular piece of equipment but only to say that it should be maintained.

And for a piece of equipment to be maintained you must have a system and that system must be followed.

You must have operators and men who will follow the system religiously and completely.

As for the actual servicing of any piece of machinery, all reliable manufacturers of power equipment are glad and anxious to help and to specify as to what should be done to repair a certain deficiency or breakdown.

The majority of my time has been spent in stressing the importance of records, inspection schedules, maintenance memoranda, and the like.

This, of course, may not be a subject which can be said to be devoted solely to power plant maintenance, but one to maintenance of a mill as a whole. But then to my mind, a proper preventive maintenance program is one that will hold good in any department or branch within any industrial mill.

A successful preventive maintenance program is one where by applying certain proven methods, continuity of operation is assured with a minimum expenditure for this operation.

Since cost of operation of any department is a mark of the failure or success of that department, and since downtime or repairs influence costs, it is necessary that all mills strive to have a maintenance program that is as economical as possible.

It is my belief that when a system has been established, and is operating efficiently that serious breakdowns and accidents to equipment and personnel will for all practical purposes cease.

It should ease the minds of the supervisory staff, promote better harmony among the operating staff, and, what is more, will give to management the thing they are asking for—an efficient, economical plant.

What more can you ask of any system?

A New Method of Coating Paper Involving Ion Exchange

By

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The history of paper coating up to the present day consists mainly of a series of improvements in mechanical methods of applying a standard coating mix to a web of rawstock. Most of these improvements have been directed at increasing speed of production by allowing high solid coatings to be used so that less water need be evaporated from the sheet.

This method of evaporating the solvent to change a liquid coating to a solid is physical.

The method that I will describe is not physical but chemical.

In describing a process of coating, I believe it would be well to review the facts of what we are really trying to do. In short, we are trying to cover something up. We are trying to brighten it, make it more opaque and give it a smooth standardized surface on which we can successfully print. Isn't this much the same problem that we have on a new house where we use paint to cover the raw lumber and give us a standard bright opaque smooth surface? Isn't it much the same problem that we have in printing a sheet of paper with inks of various colors to cover one color with another?

In one main respect, the problems are identical. We want to apply a liquid that can easily be handled and when it has been applied we want to transform that liquid to a solid. In the case of paints and inks, some of them

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become solids due to oxidation or polymerization of the oils. Some of them become solids because of evaporation of the solvent from the binder. Some of them change from liquids to solids upon the application of steam or moisture which precipitates the binder from its solvent. This method is much faster than the others and has the added advantage of allowing the coating to remain on the surface and not sink down into the base on which it has been applied.

Could such a method be used in coating paper? The answer is yes.

To evaluate the new process it might first be well to review the mechanism of present-day coatings.

When a normal type coating mix of water soluble binder, pigment and water is coated on a sheet of rawstock, whether the coating process be brush, air ductor, metal ductor, reverse roll, gravure or printing press type, the coating immediately upon application sinks down into the sheet following the surface contour of the wetted rawstock and allowing the fibers to stick up through the coating.

The water is absorbed into the paper and carries binder with it, decreasing the amount of adhesive left on the surface to bind the clay particles. The sheet is then put into a drying oven or onto a drum dryer, which before evaporating the water, heats the water-adhesive mixture, lowers its viscosity and allows more of it to drain into the sheet. The result is a coated sheet, the surface of which is rougher than the original rawstock. Certainly, the higher the solids used and the higher the viscosity coating that can be used helps to prevent this process of impregnating the sheet with adhesive, but it is far from a continuous film overlying the fibers of the raw sheet.

If the rawstock has not been sized, the penetration of the coating is much faster, the swelling of the surface fibers is greater and the fibers lift up through the coating and can give a very rough surface. If the raw sheet has been highly sized we get less penetration of the coating, less raising of the surface fibers, but perhaps the disadvantage of poor coating application and poor adhesion of the coating to the stock. In either case, we have a coated sheet that may be suitable for offset lithography or aniline printing, but it is not suitable for letterpress. The surface contour must be level enough to allow the solids and the halftone dots on a nonresilient plate to print an ink at normal impression pressures over a high proportion of the entire surface of the sheet rather than over a small proportion of the surface. We must calender in order to get surface levelness or smoothness.

The new process is a chemical one. The principle lies in the fact that certain hydroxy alkyl ethers of cellulose are selectively soluble only in a critical concentration of aqueous sodium hydroxide and in no other solvents. These ethers are suitable as adhesive binders for clay and other pigments. They are linear polymers of high molecular weight, are capable of forming self-supporting inherently flexible films and have extremely high adhesive properties. They can, therefore, be used in very small amounts.

Because they are soluble in only one solvent, it can easily be seen that any unbalancing of this solvent equilibrium will precipitate the ether or binder from its solution. Therefore, it is possible, by either increasing the sodium hydroxide concentration, or by decreasing it or by exchanging the sodium ion of the sodium hydroxide for any other ion, to immediately change a fluid solution to a nontacky solid.

When a coating mix is made using such an adhesive for the binder, the formula would consist of clay or other pigment, dilute aqueous sodium hydroxide as the solvent and a small proportion of the hydroxy alkyl cellulose as the adhesive. Immediately after coating the rawstock with such a coating, by any suitable coating machine, the wet surface is contacted by a dampening roll or other suitable method of wetting, with a solution of a neutral or other salt that will simultaneously precipitate the HAC from solution by ion exchange, occluding the clay or other pigment in the smooth precipitated film and also neutralize the sodium hydroxide of the solvent and bring the pH of the coating to any desired end point.

The excess of the precipitating and neutralizing salt solution together with excess water of the original coating are removed by passing the sheet through squeeze or press rolls, such as are used on a size press. The caustic of the solvent does not harm the rawstock in any way as it is neutralized almost at the same time that it is applied. By ion interchange of the sodium ion of the sodium hydroxide for some other ion of the salt used to precipitate and neutralize, no acid is necessary for neutralization to cause excess acidity that would be deleterious to the rawstock.

Chemistry of the process is simple. When a salt such as ammonium sulphate is used as precipitator and neutralizer, the sodium ions of the aqueous hydroxide solvent for the cellulose ether binder exchange for the ammonium ions of the ammonium sulphate, immediately forming sodium sulphate and ammonium hydroxide. The binder is not soluble in ammonium hydroxide so is immediately precipitated to a nontacky solid form. The ammonia of the ammonium hydroxide formed is volatilized leaving a substantially neutral film. If an acid salt is used as the precipitator, the reaction products are, of course, the added sodium to the salt used, and water. Combinations of acid salts can be used to give any pH desired in the finished film coating.

Other non-reacting substances may also be present in the precipitating bath that may impart various characteristics to the surface of the coated film without involving the cost of having to be dispersed throughout the entire coating. A choice of ionic charges can easily be imparted to the surface in this manner. Colloidal gels or sols can be applied to the coating surface in extremely thin films. Any of the commonly used pigments may be used in this process.

The coating may be applied to the coating rawstock by any of the known methods, but preferably by a method that does not apply a pattern. Immediately after the coating is applied, it is contacted with an aqueous solution of a salt capable of ion exchange with the sodium hydroxide present in the coating.

Immediately following this contact, all excess setting solution and some of the water in the original coating is squeezed out by passing the sheet between two rollers, one of which has a somewhat resilient surface. A normal size press is very suitable for this operation. The sheet is then dried, preferably in contact with a drum dryer or a series of paper machine dryer rolls. This drying under tension is important to eliminate cockle from shrinkage. The finished dried sheet is level in surface contour to the extent that it does not have to be calendered.

Speed at which this method of coating can be used is entirely dependent on the mechanical capabilities of the coater and drying units. The time necessary for the ion exchange to take place is so short that it need not be taken into consideration on speed of coating.

The process is ideally suited for "on the machine" coating especially on machines that already include a size press. The press can be used for setting or precipitating the coating and squeezing out the excess water. An applicator roll and air ductor can be placed just ahead of the press rolls. The process is also ideally suited for simultaneous double side coating as no sticking is possible on the drying drums.

The advantages of a sheet coated by this process are many.

Because the coating has been applied as a smooth film and has been solidified while in that condition before penetration into the rawstock, it does not require supercalendering. Because of this fact that it has not been transparentized, embrittled, glazed and compressed, it has much greater brightness, more opacity, more flexibility, much greater affinity for ink, much better adhesion of ink to the surface, better lay of ink on the surface, much better compressibility of the coated sheet to save make-ready time on the press, and uniformity of finished product — due to the fact that the adhesive is stable indefinitely both as to viscosity and as to resistance to bacterial growth.

When suitable unpigmented coatings are applied by the same process to paper or board, the resultant products are oil-proof, grease-proof, and solvent-proof.

Latex as an Adhesive for Machine Coating of Paper

By

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The use of latex as a paper coating adhesive is now well established. Three years of commercial experience have demonstrated that this new and unusual type of binder has a permanent place in the industry. Originally, it was introduced as an extender or substitute for casein when that binder was in very short supply just after the war. Since then, many of the special properties of latex as a binder have been studied and it has become established as a new tool to aid in meeting the demands of the printing industry for a more uniform coated paper with improved printability.

Latex has been used in largest volume in coating paper off the machine, both alone and in combination with the other adhesives. By far the most important field of use has been as a modifier for starch, soya protein and casein to modify the properties of these coated papers. Although such modification has been attempted with several types of latices, the only one of commercial significance has been Dow Latex 512K, a styrene-butadiene copolymer dispersion.

This latex was found to be easy to use in all types of coating processes. Therefore, the development spread quickly to machine coating once paper manufacturers became convinced that it was working satisfactorily in off-machine coating. The development period for the former was long due to the more complicated process of manufacture and the difference in cost of the latex as compared to the normal adhesive, corn starch. However, the development stage is rapidly passing and new grades of machine coated paper containing Dow Latex 512K are being established regularly.

In off-machine coating, latex is used principally to improve the smoothness, gloss, flexibility, or wet rub resistance of the coating. It may also be used to make a coated sheet with superior gloss ink or varnish "hold out" and still retain satisfactory printability. These improved properties are important in any printing paper no matter what coating method is used. Where such improvements are desired in machine coated papers, the use of latex is just as strongly indicated as it is in off-machine coated papers.

Three types of machine coating where latex may generally be used as a modifier for other adhesives are: (1) Size press coating; (2) Doctor blade coating; and (3) Print roll coating.

Size Press Coating: The use of the size press on the machine as coating equipment is not considered to give a true coated paper. Since low solids, low viscosity coating colors are used, coating weights are generally low. The coating also has a tendency to soak into the paper leaving paper fibers exposed. However, such a coating does fill in the surface of the paper and may be used to improve the printability of an uncoated printing paper or as a precoating to be followed by off-machine coating.

Where the process is used to improve the printability of uncoated paper, 512K offers some very desirable advantages. It has low viscosity at 45 percent solids and has less tendency to soak into the paper since it is carried in the water as solid particles in the same fashion as pigment particles are carried in the pigment slurry. These properties permit putting a heavier coating on the paper surface than can be obtained with starch alone. Since 512K gives binding power without interfering with printability, formulations containing the customary relatively high proportion of binder produce a paper with excellent printing characteristics.

Where the process is used for precoating to be followed by off-machine coating, the use of 512K offers still other advantages. Since the precoat is not supercalendered and is to be overcoated, entirely new and unusual binder combinations are possible. A starch or starch-512K coat can be put on at the size press and followed by a protein or protein-512K overcoating in a subsequent operation. The combinations and possibilities are too numerous to mention and the one to use depends on the properties desired in the finished paper.

Doctor Blade Coating: The best known use of the doctor blade coater on the machine is for the coating of paperboard with the Champion coater. It is my understanding that this coater works very well on paper and is being used without restrictions in Europe. However, in this country, the use is limited to the machine coating of paperboard. The use of 512K in this equipment does not require detailed discussion since it is used as a modifier for regular protein coating coolrs at low viscosities. The latex is used primarily to obtain better "bender" and cleaner cutting in carton manufacture. Latex can also be used to improve the printability, but other factors must also be considered.

Two of the principal properties which adversely affect the printability of coated paperboard are the light coat weight and the roughness of the board surface. With a rough board and one to two lbs. per 1,000 sq. ft. of coating, it is very difficult to improve printability by changes in the formulation of the coating color. However, these problems are recognized and are being solved by suitable engineering methods. With a smoother board surface and equipment to apply three to four pounds of coating per 1,000 sq. ft., there is positive evidence that changes in coating formulation may be helpful. In such coatings 512K will aid smoothness, finish, gloss ink and overprint varnish 'hold out" and improve the abrasion resistance of the printing on the finished carton.

Print Roll Coating: The most complex coating method is print roll coating which may further be divided into multiple roll coating, gravure roll coating, and combinations of the two. The methods are similar in that high solids coating colors are used and relatively high shearing forces are involved in applying the coating to the paper or paperboard. In general, corn starch is used as the adhesive for both paper and paperboard but, to date, Dow Latex 512K has been used commercially only in the coating of paper.

Latex adhesive for use in print roll coating must exhibit the highest order of mechanical stability and, even then, must be properly handled in order to perform its function adequately. For this reason, work on latices for machine coating was retarded until considerable experience was obtained in off-machine coating. Only the most foolproof latex can even be considered for test, since most of the experiments must be carried out on the paper machine itself. For this reason, only 512K has thus far found a place in the industry as an adhesive for general use in print roll machine coating.

Each machine must be treated individually and experiments carefully carried out to obtain the desired improvements in printing properties of starch-512K coated papers. To date, modifications of as low as ten percent of the total adhesive have given beneficial results, but marked changes in properties are rarely observed at less than a 25 percent replacement of the starch. One of the problems in machine coated papers is the tendency to

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apply too low a coat weight. With a low coat weight, it is difficult to improve the printing characteristics of the paper by modification of the coating color formula. The coating is not thick enough to cover the paper fibers, making the paper difficult to finish at the supercalenders.

The minimum quantity of latex used depends a lot on the base paper, thickness of coating, type of ink printing involved, and the price the mill can get for the finished product. The maximum quantity depends on these factors too, but is also limited by the application characteristics of the coating color. Dow Latex 512K replaces starch and increases the free water content of the coating color even though the latex is used at a higher solids content than starch. This markedly affects the viscosity and thioxotropy as the latex content approaches 50 percent of the total binder. This change in viscosity may be beneficial on some types of coaters since it is possible to obtain wider variations in coating weights with the same coating formula. At the high latex content, viscosity can be increased, if desired, by other formula formulation changes.

The suggestions noted here are very general in nature. This is so because the use of 512K in machine coating is relatively new and still considered confidential by most of our customers. As the use expands and the numbers and types of machine coated grades increase, it will be possible to discuss specific grades in detail and to make more accurate comparisons of printing qualities. However, paper still speaks for itself. No unusual materials are used in machine coating that are foreign to off-machine coating. Each person, as a producer of coated paper, can study the improvements that 512K has brought to off-machine coated papers and immediately apply the knowledge to machine coated papers that utilize the same materials. The question of whether or not to use latex then rests on the relative importance of the changes in properties that will be obtained.

Enzyme-Starch Conversions and Their Application To Machine Coating Colors

By

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Starch dispersions, when used as adhesives in paper coating colors, must have the required adhesive strength and must be sufficiently fluid to flow readily at the desired concentrations and temperatures. Untreated gelatinous starches, such as corn, potato, tapioca, etc., as a rule have good adhesive strength but are far too viscous at the concentrations required for most uses. Therefore starch dispersions must be treated in some manner to reduce their viscosity without excessively reducing their adhesive strength. This liquefaction may be accomplished by enzyme conversion.

The class of substances called enzymes constitutes a very important group of catalysts or chemical activators—substances which have a great capacity for influencing chemical change without actually entering into or becoming a part of the chemical reaction. Contrary to popular opinion, enzymes are not living beings; rather they are proteins produced by and extracted from such living matter as yeasts, molds or bacteria; and their action is completely independent of the cell which produced them.

Of great industrial importance among them any types of enzymes are the hydrolytic enzymes—those which cause water to unite with fats, proteins or carbohydrates, and split these substances into smaller molecules. There are two general classes of starch converting, or amylolytic enzymes—alpha amylases (liquefying enzymes) and beta amylases (saccharifying enzymes). The preferred enzyme for starch conversions used as coating binders would be of the first-mentioned type, which acts upon starches to reduce their viscosity by liquefaction and converting them to dextrins with the formation of a minimum amount of sugar. By contrast, the saccharifying enzymes, as represented by malt enzymes, tend to convert a large portion of the starch to maltose or sugar, which has little or no adhesive strength.

Some of the necessary factors to consider when making enzyme starch conversions are: (1) The amount of enzyme required; (2) The optimum pH environment; (3) Temperature cycle; and (4) Enzyme inactivation.

The Amount of Enzyme Required: The amount of enzyme required for a starch conversion depends upon a number of factors including—the starch concentration, kind of starch used, viscosity desired, cooking equipment, etc.

The Optimum pH Environment: Enzymes exert maximum liquefying activity within certain pH ranges. These ranges vary depending upon the type of enzyme used.

Temperature Cycle: The starch suspension containing the enzyme is heated to a temperature slightly above the gelatinization point of the starch. The mixture is held at this temperature until the desired conversion is obtained as indicated by the viscosity. When the desired viscosity is reached, the enzyme is inactivated by means of high temperatures or chemical inactivation.

Enzyme Inactivation: Enzymes can be inactivated by high temperatures or by chemical precipitation. Generally, temperatures of 200° F. or higher will inactivate most amylolytic enzymes. The addition of chemicals, such as the salts of the heavy metals, will cause precipitation of the enzyme and complete inactivation. Some enzymes will precipitate in acid media, so the addition of strong acids, such as HCl or H_2SO_4 will promote inactivation.

In the usual preparation of paper coating colors, it generally is the practice to disperse the clay, or other minerals or pigments, in water by mechanical agitation and then mix the resulting dispersion with a starch adhesive which is prepared separately. If an untreated starch, such as raw corn, tapioca, or potato, is to be used as the adhesive, the starch is dispersed in water, an amylolytic enzyme added, and the mixture heated to convert the starch to a composition having the desired physical and chemical properties. This adhesive composition is then mixed into the aqueous mineral or pigment suspension. Enzyme starch conversions for this type of application can be made at concentrations as high as 50 percent solids.

A new patented process has been developed which consists of preparing coating colors by converting the starch with an enzyme in the presence of minerals and pigments. Coating colors can be prepared with this process at exceptionally high solids contents, having lower viscosities than those produced by conventional methods. Commercial practice has indicated that this new process produces maximum dispersion of the minerals and pigments involved in the coating, and more efficiency is derived from the starch adhesive as indicated by the Dennison wax test.

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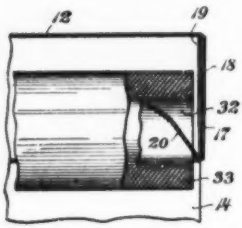
Patent Abstracts

● ***In addition to abstracts on the technology of pulp, paper and related industries, miscellaneous abstracts which may provide useful information to our readers are included herein.***

2,458,844—Packaging. James Foote, Plattsburg, N. Y., assignor to B.F.D. Company, New York, N. Y., a corporation of Maine. Filed Jan. 5, 1946—Issued Jan. 11, 1949.

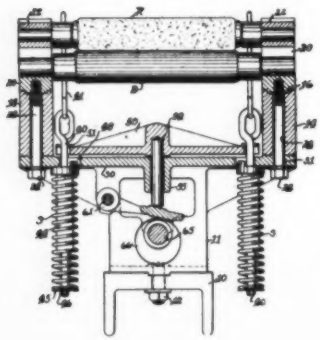
An integral blank for a dispensing carton for holding a roll of sheet material having a core and dispensing lengths of said sheet material, comprising a rectangular front section having



extensions on each side thereof separated from the front section by a score line and adapted to form side elements having end margins and side margins, a rectangular bottom section separated from said front section by a score line and having two side extensions separated from said bottom section by score lines which side extensions are adapted to form side elements having end margins and side margins, a rectangular back section separated from said bottom section by a score line and having two side extensions separated from said bottom section by score lines and adapted to form side elements having end margins and side margins, a rectangular top section separated from said back section by a score line, one of said side elements extending from each side of one of said sections having a further bearing extension at its side margin adapted to be formed into bearing relation with the core of a roll of sheet material to be dispensed.

2,458,852 — Roll tension device. Sigurd H. Helland, Whitinsville, Mass., assignor to Whitin Machine Works, Whitinsville, Mass. Filed May 31, 1946—Issued Jan. 11, 1949.

In a drawing mechanism having pairs of



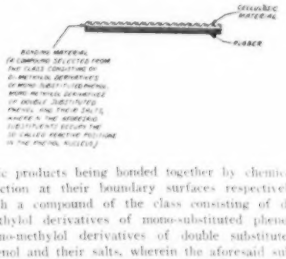
drawing rolls, bearing boxes for said rolls and side rails along which said boxes are adjustable, in combination, a cross bar for each pair of drawing rolls, a bolt extending through each end of each cross bar and through the adjacent side rail and into the adjacent bearing box and clamping said three parts together, with said cross bar and said bearing box in permanent assembled alignment, and spring tensioning means for each pair of rolls positioned and guided by the associated cross bar and shiftable therewith along said rails.

2,458,750—Removable floor or wall covering. Samuel G. Trepp, Dedham, Mass., assignor to Bird & Son, Inc., East Walpole, Mass. Filed Apr. 2, 1946—Issued Jan. 11, 1949.

A hard-surfaced flexible removable covering for floors, walls, and the like, adapted to be cemented to an underlying supporting surface by linoleum paste, comprising a fibrous base saturated with bituminous material, an ornamental tread layer on one side of said fibrous base, and a flexible, dry, coherent non-tacky backing coat on the opposite side of said base consisting essentially of a composition including rubber selected from the class consisting of isobutylene-diolefin copolymer, neoprene, butadiene-styrene copolymer, vulcanized natural rubber, and vulcanized reclaim rubber, said composition including pigment and a water-soluble organic binder, the rubber Content of said composition not exceeding 20% (by weight) thereof, the internal cohesive strength of said backing coating and its bonding strength to the floor covering being sufficient to firmly anchor the floor covering to an underlying layer of hardened linoleum paste on a supporting surface but at least one of said strengths being substantially less than the internal cohesive strength of said saturated base, whereby said base is strippable as a unit from said supporting surface after attachment thereto by such hardened paste.

2,458,886—Method of bonding cellulosic materials to rubber and composite products formed therefrom. Johannes G. Weeldenburg, Velp, Netherlands, assignor to American Enka Corporation, Enka, N. C., a corporation of Delaware. Filed Apr. 12, 1946—Issued Jan. 11, 1949.

Vulcanized rubber articles reinforced with cellulosic products, said rubber articles and cellu-



losic products being bonded together by chemical reaction at their boundary surfaces respectively with a compound of the class consisting of dimethylol derivatives of mono-substituted phenol, mono-methylol derivatives of double substituted phenol and their salts, wherein the aforesaid substituents occupy the so-called reactive positions in the phenol nucleus.

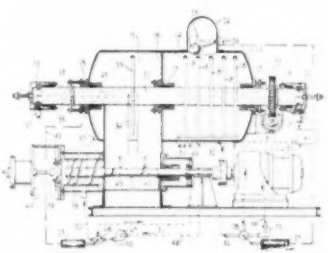
A method of bonding cellulose products to rubber which comprises surface treating the cellulose product with a compound of the class consisting of di-methylol derivatives of mono-substituted phenol, mono-methylol derivatives of double substituted phenol and their salts, wherein the aforesaid substituents occupy the so-called reactive positions in the phenol nucleus, centrifuging and drying the cellulose product, combining the treated cellulose product with rubber and vulcanizing the composite product.

2,458,893—Apparatus for conducting ion exchange operations. Robert C. Campbell, Millburn, N. J., assignor to The Dorr Company (Inc.), New York, N. Y., a corporation of Delaware. Filed Oct. 6, 1945—Issued Jan. 11, 1949.

In combination a liquid treatment cell comprising a closed receptacle adapted to hold a bed of granular ion exchange material, said receptacle having means for feeding liquid to the top portion of said bed for passage downwardly therethrough, and having means for discharging liquid from the bottom portion of said bed whereby the bed is adapted to be kept in submergence, and a system for controlling the level of the liquid passing downwardly through the bed so as to maintain said level substantially constant comprising a supply conduit for an auxiliary gaseous pressure medium connected with said cell in a manner to exert pressure upon the liquid level, constant pressure control means for maintaining said pressure substantially constant, a throttling device for controlling the rate of discharge of said liquid, and actuating means for said throttling device operable to increase the flow resistance thereof when the liquid level has unduly dropped and to decrease the flow resistance when the level has unduly risen, a float controlled device actuated by said liquid level, and impulse transmitting means for transmitting impulses from said float controlled device to said actuating means whereby a rising of the float in the float controlled device effects a substantially corresponding increase of said flow resistance and a falling of the float effects a substantially corresponding decrease of said flow resistance.

2,459,082—Filter. William McCaskell, Los Angeles, Calif. Filed July 11, 1945—Issued Jan. 11, 1949.

In a filter of the class described, the combination comprising a closed container rotating



means connected to said shaft for rotating the same having two separated and closed compartments, a shaft extending therethrough, a slurry thickener in one compartment of said container including filter means mounted on said shaft, means to withdraw filtrate from said compartment through said shaft and filter, a second filter mounted on said shaft in a second compartment, means to transfer thickened slurry from said first compartment to said second compartment, means to remove filtrate from said second filter through said shaft, and means to remove filter cake from said second compartment.

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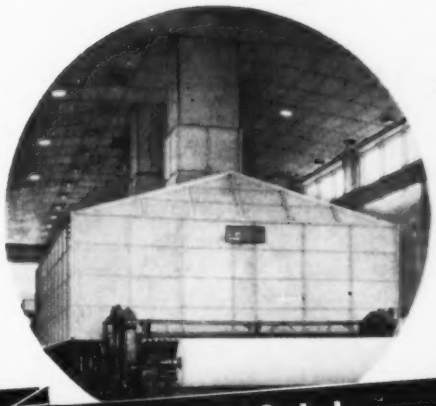

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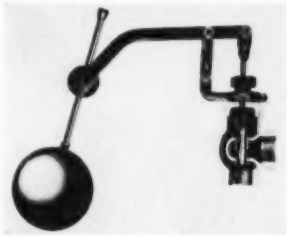
EQUIPMENT

Color Computing Device

A color computing device, known as the Librascope Tristimulus Integrator, will tell immediately whether a given color will match another and, if not, will describe the difference between them, it is stated. The device integrates over all positions of the visible spectrum, and figures out the answer to a series of computations involving integral calculus before one can sharpen a pencil to undertake the same job by hand. The integrator, an electronically controlled ball and disc mechanism, which is connected directly to the spectrophotometer gives the correct result the instant the spectrophotometer has "looked" at the color. Together, the two instruments — the recording spectrophotometer and the Tristimulus Integrator — not only measure and analyze color in 2½ minutes, but yield a numerical specification of what we see with hitherto unobtainable accuracy. Prior to the invention of the Integrator, the use of numerical specifications in colorimetric problems was considered generally impractical because of the time and labor required for calculations. It was therefore necessary to rely on the eye for detection of color differences, and on words which do not mean the same thing to everybody, to convey the quantitative differences seen by the eye. Data on light sources and the sensitivity of the average eye were standardized by the International Commission on Illumination in 1931, and data on reflectance of a colored sample may be obtained from the recording spectrophotometer. These values must then be combined mathematically to give three numbers known as the tristimulus values, which are a unique specification of the color observed. The new computer multiplies the data at each wavelength and sums up the products to obtain these three numbers, completely automatically. Instrument was designed for use with the G.E. Spectrophotometer invented by Prof. Arthur C. Hardy of M.I.T. Only minor modifications of the spectrophotometer are said to be required, and the computer may be placed inside existing case. According to its inventors, the computer calculates the tristimulus values with a precision of about five hundredths of one percent and calculations are completed within the 2½ minutes required for measurement of a sample in the spectrophotometer. For details and prices write to General Aniline & Film Corp., 230 Park avenue, New York 17, N. Y.

Keckley Float Valve

Keckley Float Valve is designed to maintain maximum high level on make-up line to an open tank, opening when the water level recedes and closing when normal level in tank is restored. Described as a pressure-operated valve that will function if there is no pressure. Action is governed by pilot stem attached to float by means of lever and float rod. Pin through stem attaches it to inner valve assembly. There is sufficient sure operation before weight of float lifts the inner valve (as it does when there is no pressure), it is stated. Inlet pressure enters on top of disc and seeps by the loosely-fitted piston into the top chamber. Pilot stem seats in the central port and controls pressure in the chamber. Pressure in top chamber is then relieved and the valve is open. As water level in tank rises and contacts the float, pilot stem is forced to its seat. Pressure then accumulates in top chamber and closes the valve. Construction details feature efficient, tight closure, there being no internal packing to swell and cause excessive friction. Renewable composition disc provided for either hot or cold water, as specified. Metal disc also may be had if required. For details and prices write to O. C. Keckley Co., 400 West Madison street, Chicago 6, Ill.



Electrically Heated Rubber

Use of electrically heated rubber of the wire resistor type which proved successful in various aircraft applications has been extended to industrial applications, it is announced. American rubber of a type which is heat, weather and oil resistant is used. Construction is of resistance wires insulated with fabric plies sandwiched between layers of rubber sheeting with the parallel wires running the length of the rubber. Can be furnished in any reasonable size, shape or weight, and for temperatures to 300°F., it is stated. Heating of rubber starts when it is connected to any electrical outlet. Operation is generally controlled by thermostats. Each application in which the heated rubber is used must be engineered separately with size, voltage and temperature desired entering into the calculations, the manufacturer points out. It can be applied by adhesion or placed on a metal background for bolting into permanent position. Among industrial uses already reported are a strip heater for moisture control to reduce condensation in a deep freeze unit, heat booster pads for tire repair machines, and as foot warmer pad for cold floors. Manufacturer foresees among other immediate uses: to stop freezing in pipes and maintenance of temperature in hydraulic systems, and to free material frozen in chutes or bins. For details and prices write to B. F. Goodrich Co., Akron, Ohio.

SUPPLIES

Polychols

Polychols are non-ionic surface active agents consisting of mixed polyoxyethylene glycol ethers of cholesterol, lanosterol and straight chain alcohols. Grades of varying polymerised ethylene oxide contents are to be produced, but the first *Grade I.M.* (Mono-ethers) and Grade I.D. (Di-ethers), contain the equivalent of 130-140 molecules per molecule of condensate, it is stated. Polar portion of their molecules will be largely due to the sterols, steroids and triterpene alcohols condensed with the alkylene oxide, as distinct from straight chains of the higher aliphatic alcohol ethers previously available. Representing new research in detergents, in wetting, dispersing, emulsifying, penetrating and spreading agents, the product is available in bulk quantities in solid anhydrous form or as a 50 percent solution in water. For details and prices write to Croda House, Snaith, Goole, Yorkshire, England.

Powdered Glutite

Glutite — described as a fully dehydrated flexible and non-warping glue — is now available in dry powdered form. Comes packed in 100-lb. bags. Equal parts of Glutite and cold water melted in heated glue spreaders to 110° F. are said to serve efficiently on difficult tight wrapping operations. For details and prices write to Burton H. Greenwood, 126 Cedar street, Nutley 10, N. J.

LITERATURE

Clark-Aiken Co., Paper Mill Machinery Div., Lee, Mass. Bulletin 101, "Rotary Paper Cutter." Sales copy and illustrations on new cutter which features patented worm-gear micrometer adjustment to accommodate different thicknesses and grades of paper.

Lukens Steel Co., 105 Highway Bldg., Coatesville, Pa. Book, "Steel Plates and Their Fabrication," edited by Lionel S. Marks, Gordon McKay Professor of Mechanical Engineering, Emeritus of Harvard University. Reference book for engineers and designers who work with steel plates and structures of which steel plates are a part. Contains extensive data of value for ready reference in selecting steel plates best suited to particular projects, also information on analyses of physical properties of carbon and low alloy steels with charts and tables showing their behavior under sustained and repeated loadings, and their resistance to abrasion, corrosion and temperature. Factual material on nickel, stainless, inconel and monel-clad steels, their physical and mechanical properties and plate and head sizes included. A sec-

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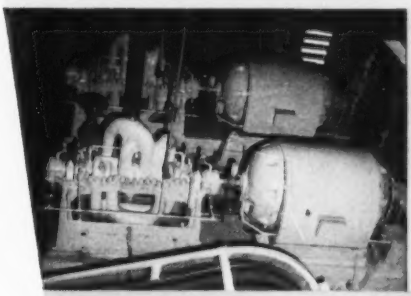
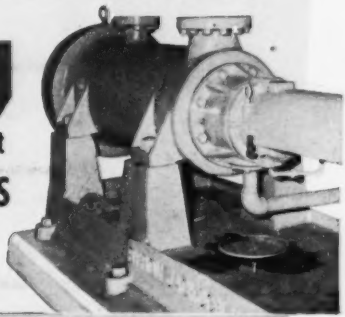
BJ debarking pumps

Multiplex Barking any capacity at pressures to 1300 psi. These BJ Multistage Barking Pumps have horizontally-split case design with integrally-cast crossover passages. Opposed grouping of impellers equalizes end thrust. The BJ staggered volute design balances the high radial forces . . . eliminates objectionable shaft deflection found in other multistage pumps. BJ Multiplex Pumps operate continuously at maximum efficiency and are easy to assemble and to disassemble. Units in operation have set new standards of efficiency in hydraulic log barking.

Double Case, Double Volute Large capacities at pressures from 1000 to 2800 psi. This widely accepted BJ Pump is remarkably simple to disassemble. When internal inspection is needed, the outer barrel cover is unbolted and the dismantling tray attached. Inner case pulls out onto the tray. Upper half of the inner case is raised and the *completely assembled rotating element* LIFTED out. No need to disturb the main piping and the driver. The inner case, by its double volute design and staging arrangement, eliminates axial and radial thrusts as well as shaft deflection.



BJ built-to-last pumps



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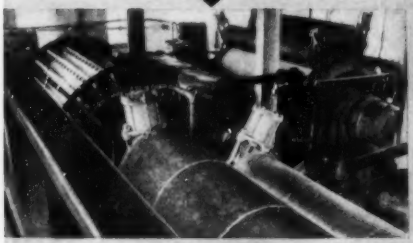
Nopco Paper Chemicals eliminate many operating difficulties, cut costs, save time, improve the finished sheet. In addition to items listed here, they include soaps, synthetic resin emulsions, plasticizers and lubricants for use in all phases of manufacture—whether paper, paper board, insulating board, pulping and rag cooking, tissue, or converting. Full information is yours for the asking. Write us today.

Courtesy of Eastern Corp., Bangor, Me.

DIGESTER

NOPCO Nopalcol*
An additive that helps to reduce cooking time of sulphite pulp.

Pitch Control is initiated here by the addition of a solvent. This solvent aids in keeping liberated pitch in solution so it may be effectively handled later in the system.



WASHERS

Pitch Control

NOPCO 1216-V Used in the Washer, Nopco 1216-V emulsifies the solvent and the pitch in the solvent to reduce the liberated pitch content of sulphite pulp.

Foam Control

NOPCO KF (for Sulphite) With its unique ability to destroy foam, Nopco KF increases the operating efficiency of pulp screening and pulp refining equipment.

NOPCO 1333-B (for Kraft) Here is a highly concentrated product that eliminates foam and promotes efficiency in the production of sulphate pulp.

OTHER EFFICIENT NOPCO DEFOAMERS for use in pulping and bleaching operations are: NOPCO KFH, NOPCO KFS, NOPCO 1519, NOPCO Vegifat Y.

BEATER

Sizing

NOPCO 2251-X, NOPCO 2251-B These anhydrous wax size bases are prepared for easy handling in the mill. Nopco 2251-X requires the addition of water only; Nopco 2251-B, the addition of wax and water. Both yield emulsions stable from infinite dilutions up to 70% solids.

NOPCO 2252 — Paraffin Wax Size An efficient sizing agent, giving a consistently uniform size unaffected by water conditions, pumping action or operating temperature. Equally effective in all types of furnishes. Stable in any dilution. Ideal for mills with small requirements or limited mixing facilities.

NOPCO 2146-R A high free rosin size emulsion, particularly valuable in hard water areas.

NOPCO Size I An efficient waterproofing agent for asbestos paper—and photographic printing papers, where chemical stability of sizing agent is essential.

Softening

NOPCO Softener #73 Specifically formulated for use in manufacture of high grade tissue and towelling. Stabilizes the absorbency of the finished sheet and gives unusual softness. The affinity which this cationic softener has for the fibers, permits its addition at the beater or at any convenient point in the stock preparation cycle.

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Sheet Formation

NOPCO KF Improves sheet formation, even at increased machine speeds, by eliminating foam and faulty fiber dispersion; dissipates entrained air. Outstanding advantages: at least 75% reduction of thin spots, reduced breaks; improved surface characteristics.

Clean Up

NOPCO 1216-V This emulsifier, when used with a solvent, removes asphalt and pitch deposits from metallic surfaces. An excellent medium for cleaning screens, wire and suction rolls.

Courtesy of Whippany Paperboard Co., Whippany, N. J.

PRESSES

Felt Washing

NOPCO Syntergent*K A felt washing compound that may be used on or off the machine. Mixes readily with warm or cold water; gives a rich, persistent lather. Dispersible and stable in dilute acid or alkaline mediums. Rinses out freely when washing is complete; leaves felt soft and well napped.

Courtesy of Black-Clawson Co., Hamilton, Ohio

DRYER SECTION

Machine Coating

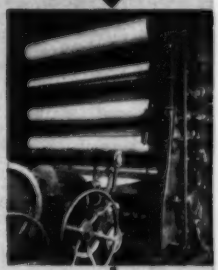
NOPCO ESI Improves flow characteristics as well as brightness and gloss. May be used in casein or starch coatings.

NOPCO 1400-B (Ammonium Stearate) Functions as a plasticizer, and aids in controlling dusting on the calender rolls.

MACHINE CALENDER STACK

NOPCO 2252 — Paraffin Wax Size Besides being used in the Beater, Nopco 2252 may be used as top or surface size in the Size Press or Calender Water Box. Often employed with starch, glue or casein emulsions. Improves printing qualities and increases scuff resistance of paper board.

NOPCO ESI Used in conjunction with starch to improve gloss ink printing on folding box board.



CONVENTIONAL COATING

NOPCO 1400-B (Ammonium Stearate) Added to coating color formulations, Nopco 1400-B plasticizes the coating; helps to minimize dusting during supercalendering.

NOPCO 1600-B May be used advantageously for all general defoaming and evening requirements. Minimizes fish eyes and similar defects. Works well with colored coatings...

NOPCO Sulfonated Oils and Fats Incorporated into the coating mix, these materials impart plasticity, reduce foam, promote evenness of application.

NOPCO ESI Flow, brushing characteristics, brightness and gloss of casein and starch coatings are all improved by addition of Nopco ESI. Dusting troubles usually developing on the Super Calender are substantially reduced when Nopco ESI is added to coating color formulations.

NOPCO 1810-L — Wax Emulsion An acid stable wax size used to impart plasticity to coating color mixes.

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tion of more than 100 pages of general engineering information provides mathematical tables, conversion tables and material of frequent reference. Illustrated with some 375 charts, graphs, isometric and other explanatory drawings, and photographs of steelmaking and fabricating operations. Engineers and designers desiring a copy of the handbook should make request on their company letterhead to Lukens Steels Co.

Simon & Schuster, Inc., 1230 Sixth avenue, New York 20, N. Y. Book, "The Coming Age of Wood," by Dr. Egon Glesinger, Chief of Forest Products Branch of the Food and Agriculture Organization of the UN, price $6.50. Presents in simple, direct fashion developments in forestry and wood industries which will double the world's standard of living. Dr. Glesinger authoritatively indicates how we can anticipate plenty, not starvation, superior housing not shortages, ample supplies of clothing not nakedness. Part I gives the history of wood and shows how the goals of plenty will be achieved. Part II supplies the technical aspects of the problem in charts and pictures. Part II delves into the technical problems involved and indicates world progress on each. "This is the Atomic Age" said Dr. Glesinger, " and its dynamic-sounding name symbolizes progress. That does not make it any less the Age of Wood. " " " This book, which is written not for a few specialists but for the general public, will I hope create widespread interest in the contribution which modern technology applied to forest products can make both to industrial prosperity and to the increase of the world's real wealth."

Richard D. Irwin, Inc., 332 S. Michigan Ave., Chicago, Ill., sponsored by Controllership Foundation, Inc., edited by Thornton F. Bradshaw and Charles C. Hull. Book, "Controllership in Modern Management," 300 pp., price $4.00. A comprehensive symposium on an important phase of present-day business organization. Sheds much light on specific aspects of the controller's job: budgeting, reports to management, classification of accounts, cost accounting, marketing and administrative cost problems, inventory valuation and control, depreciation policy, financing and many others. Approximately half the book is devoted to non-technical aspects: organization of the controller's department; selection and training of controllership personnel; education and experience required of controllers themselves; reactions of other executives and employees to standards and controls; and the part of progressive controllers in public relations for their companies and for private enterprise in general.

Stanford University Press, Stanford, Calif. Book, "U. S. International Timber Trade in the Pacific Area," by Ivan M. Elchibegoff, price $7.50. From his wide experience as economist, lecturer and teacher, as well as extensive government service and research, Dr. Elchibegoff presents an exhaustive, scholarly and much-needed study in a field of great current interest. Collates information not elsewhere available on the timber situation of the U. S. and 26 other countries; interdependence of the economic geography of land utilization, forest resources, and the population; economic and political issues involved; forest policy and conservation; pulp, paper and chemical developments and the timber trade; costs of production and lumber prices; U. S. tariff policy on lumber; ocean transportation and timber trade in the Pacific; world supplies; status and outlook. Includes 26 charts and maps which show clearly the distribution of forest resources in each country and trade proportions of the different countries. Desirable as reference book.

Hilger & Watts, Ltd., 98; St Pancras Way, Camden road, London, N.W., 1, England. Book, "Absorption Spectrophotometry" by G. F. Lothian, M.A., F. Inst. P. Obtainable in the U. S. from Jarrell-Ash Co., 165 Newbury street, Boston, Mass., price $7.60. A manual on the measurement of absorption spectra in the ultra-violet, visible and infra-red regions of the spectrum by photographic, visual and photoelectric methods. The book is an attempt to set out the laws governing absorption of electro-magnetic waves by material media with examples of the ways in which these laws are being used in practical problems in the research and analytical laboratory. A handbook for the investigator who is employing spectrophotometry, and contains much of interest to those contemplating use of that method. Describes the apparatus to be used. Also shows the accuracy to be anticipated and essential conditions for realizing that accuracy. Examples of work done in selected fields are included.

Newsprint Service Bureau, 342 Madison avenue, New York 17, N. Y. Book, "Newsprint Paper in North America" by Royal S. Kellogg, price $10.00. Combines the author's 30-year accumulation of records and personal study of newsprint manufacture and use with numerous statistical tables and charts. Principal chapters are *Definitions*, an interpretation by the Treasury Department of "Standard Newsprint" from 1922 to date; *Capacity*, by mills in U. S. and Canada; *Production Consumption; Newsprint Prices; Cost of Making; Composition of Newsprint; International Trade; Mill Ownership; Where Wood and Water Meet; World Distribution*. Makes available information never before put between covers.

Taylor Instrument Companies, Rochester 1, N. Y. Booklet, "Taylor Technology, Spring 1949 Issue." Contents: Industrial Instruments Vital to Production of Streptomycin at Merck & Co., Inc.; The New Transaire Temperature Transmitter; Uniform Vulcanizing Assured by Fulscope Controllers on World's Largest Belt Press; Automatic Controls Make Possible the Successful Operation of Continuous Process for Purifying Carbon Disulphide; Coordinated Control—A Study of the Mental Processes of an Instrument Engineer.

International Nickel Co., Inc., 67 Wall street, New York 5, N. Y. Booklet, "Stock Lines, Lighter Weight, Longer Life, Lower Cost." Intended primarily for the pulp and paper industry, it quotes records of Monel stock lines which have been in service handling bleached and unbleached stock for over 15 years. Lists over 35 centers in U. S. and Canada where technical information may be obtained on metal problems as they affect pulp and paper plants.

Hauser Machine Co., P. O. Box 7116, Fort Worth, Tex. Bulletin, "Hauser Pallet Unloader." Sales promotional copy introducing this specialized equipment designed to handle merchandise of uniform size with fork trucks. Illustrations of actual installations point up simple operation and maneuverability, also features of construction.

Farrel-Birmingham Co., Inc., Ansonia, Conn. Bulletin, "Speed Reducers." Contains complete information on wide range of sizes and capacities; simple directions for selection by horsepower and speed required; descriptions of units of single and double reduction types, specifications, horsepower rating tables, overhung load capacities, dimensions and weights.

B. F. Goodrich Co., Akron, Ohio. Catalog section, 3460, "B. F. Goodrich Air Hose." Features "Highflex" construction, specifications and applications. Also describes and list specifications on company's complete line of hose.

Lawrence Machine & Pump Corp., 371 Market street, Lawrence, Mass. Bulletin 203-4, "Lawrence Acid and Chemical Pumps." Illustrates and describes centrifugal pumps for applications where corrosive and abrasive liquids must be handled. Provides specifications, sizes and capacities, operating characteristics, also chart of recommended metals and alloys for pumping various liquids.

Henry A. Gardner Laboratory, Inc., 4723 Elm street, Bethesda, 14, Md. Bulletin, "The Hunter Multipurpose Reflectometer, Description and Instructions." Contents covers applications; principle of operation; attachment and modifications; preparation for operation; operation; maintenance; price list.

Dunod, 92, Rue Bonaparte (VI), Paris. Book, "Les Méthodes de la Chimie de la Cellulose" by Ch. Dorée, M.A., D.Sc., F.R.I.C. Basic handbook for the study of cellulose and its derivatives.

General Electric Co., Apparatus Dept., Schenectady 5, N. Y. Bulletin, "Switching Power That Saves" (GEA-5183). Describes standard diesel-electric locomotives for industrial switching.

MEETINGS . . . . .

ASSOCIATION EXECUTIVES: Please send us your meeting dates and locations for this column as far in advance as possible. No charge for publication.

JUNE 27-JULY 1: Annual Meeting, American Society for Testing Materials, Chalfonte-Haddon Hotel, Atlantic City, N. J.

SEPTEMBER 8-10: American Pulp & Paper Mill Superintendents Ass'n., Inc., New York-Canadian Division, Champlain Hotel, Bluff Point, Plattsburgh, N. Y.

SEPTEMBER 12-15: West Coast TAPPI Meeting, Multnomah Hotel, Portland, Oregon. For further details, write to V. A. Wise, Griffith Rubber Mills, 2439 N.W., 22nd Ave., Portland, Ore.

SEPTEMBER 21-23: Direct Mail Advertising Association, Inc., Annual Conference, Congress Hotel, Chicago. For details, write to Frank Frazier, Direct Mail Advertising Ass'n., Inc., 17 East 42nd Street, New York 17.

SEPTEMBER 26-29: National Paper Trade Ass'n., Fall Meeting, Stevens Hotel, Chicago, Ill. For further details, write to A. W. Chamberlain, Exec. Secy., National Paper Trade Ass'n., 220 East 42nd St., New York, N. Y.

OCTOBER 4-7: Fourth Annual Industrial Packaging & Materials Handling Exposition, Convention Hall, Detroit, Michigan. For further details, write to C. J. Carney, Jr., Managing Director, Soc. of Industrial Packaging & Materials Handling Engrs., 20 W. Jackson Blvd., Chicago 4, Ill.

OCTOBER 10-14: West Coast Meeting, American Society for Testing Materials. (First national meeting of ASTM on West Coast.) Fairmont Hotel, San Francisco, California.

OCTOBER 24-28: National Safety Council, 1949 National Safety Congress, Chicago. For details, write to Harley B. Goodrich, National Safety Council, 20 North Wacker Drive, Chicago 6, Ill.

NOVEMBER 1-5: Pacific Chemical Exposition, California Section, American Chemical Society, San Francisco Civic Auditorium, San Francisco, Calif. For details, write to Marcus W. Hinson, exposition manager.

For Outstanding

EASE OF DISPERSION

BRIGHTNESS

UNIFORMITY

DU PONT

CHROME YELLOWS

PRIMROSE Y-598-D

LIGHT Y-525-D

EXCELSIOR Y-436-D

MEDIUM Y-528-D

These excellent pigments offer a complete range of shades for beater dyeing or coating

Du Pont Chrome Yellows are high-strength pigments that are very economical for coloring paper in the beater and for coating. They are clean shades, processed to give quick and easy dispersion in water vehicles

All the Chrome Yellows are standardized for color and strength in paper coloring and are outstanding for uniformity They are especially advantageous in the production of blotting paper, twisting paper, lining stock and all beater applications.

For more information about Chrome Yellows and other Du Pont pigments for papers, ask your Du Pont salesman — or write to E. I. du Pont de Nemours & Co. (Inc.), Pigments Department, 1007 Market Street, Wilmington 98, Delaware.

DU PONT PIGMENTS FOR PAPERS

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

PRICES . . . . . .

The prices below reflect general market quotations applying to those standard grades in which the normal volume of business is being done.

NEW YORK

Delivered New York

Standard News, per ton—

Rolls, contract	$100.00/ —
Sheets	115.00/ —

F.o.b. Mill, Varying Freight Allowances

Kraft— per cwt., 40# base wgt.

Standard Wrapping Rolls	$6.25/$6.75
No. 1 Wrapping Rolls	7.00/ 7.50
Standard Bag	5.75/ 6.25

Tissues— per ream 24x36 (480) 10/11 lbs. 2500 lbs. or more

Wh. No. 1 Frd.	$160.00/ —
Wh. No. 1 M. G.	150.00/ —
Wh. No. 1½	150.00/ —
Wh. No. 2	1.17½/ 1.20
Kraft Anti-Tar	1.45 / 1.50
Shrd. Wh. No. 1 per lb.	.11½/ —

Toilet— per case of 100 rolls—1 M sheets.

Unbleached 4½x4½	$5.75/ —
Bleached 4½x4½	6.95/ —
Bleached 4½x5	8.80/ —
Per Case of 50 rolls—2000 sheets	
Unbleached 4½x4½	$5.75/ —
Bleached 4½x4½	6.80/ —
Per Case of 100 rolls—1000 sheets	
Facial, 4½ x 5, 2 ply	$8.95/$9.45

Paper Towels—per case of 3750—Zone 1.

Wh. Jr. M'tif'd 9¼x9½	$8.25
Br. Sr. M'tif'd 10x12	3.60
Br. Jr. M'tif'd 9½x9¼	3.10
Br. Jr. Sgl. fold 10x10¼	3.15
Blchd. 7½ x 11, 24/25 rolls	$8.95/$6.25

Manila, per cwt.

No. 1 Jute Tag 40 lb., sheets*	$15.05/$17.50
Reg. Jute M.F. Manila, sheets*	**13.50/ 15.50**
Wrapping Manila	8.75/ 10.50
Printing Manila	**10.00/ 11.00**

*** Less usual allowance for rolls.**

Boards, per ton—

Filled News	$70.00/$72.50
Plain Chip	70.00/ —
Blchd. Mla. L.d. Chip*	**97.50/ —**
White Pat. coated*	**115.00/**
Kraft Liners 42 lb.	100.00/
Kraft Corr. .009	105.00/
Binders Boards	110.00/116.00

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1

Rag Content Bonds and Ledgers—
White, 20 lb.

Bonds

	4 Ctns. per cwt.
100% Rag Ex. No. 1	$51.40/$53.90
100% Rag	44.55/ 46.15
75% Rag	33.90/ 35.40
50% Rag	28.10/ 29.55
25% Rag	24.85/ 26.80

Ledgers

	4 Ctns. per cwt.
100% Rag Ex. No. 1	$52.65/$54.55
100% Rag	45.65/ 46.40
75% Rag	35.15/ 36.10
50% Rag	29.40/ 30.05
25% Rag	26.15/ 26.80

Sulphite Bonds and Ledgers
White, 20 lb.

Bonds

	4 Ctns. per cwt.
No. 1	$17.50/ —
No. 2	16.65/ 16.75
No. 4	15.60/ 15.95

Ledgers

	4 Ctns. per cwt.
No. 1	$18.80/ —
No. 2	18.05/ —

White Book

Conversion Coated

	Case per cwt.
No. 1	$20.75/$20.90
No. 2	19.50/ 19.65
No. 3	18.15/ 18.90

Machine Coated

No. 1	16.40/ 16.65
No. 2	14.90/ 15.15

Uncoated

No. 1 Antique (Watermarked)	16.40/ 17.90
Offset	15.15/ 16.65
A Grade E. F.	15.40/ —
A Grade S. C.	15.90/ 16.15
B Grade E. F.	14.90/ 15.15
B Grade S. C.	15.40/ 15.65

WORLD WOOD PULP MARKETS

Third Quarter Indications, Per Short Air-Dry Ton

	Delivered, with varying freight allowances		On dock Atlantic Ports Varying freight allowances		
	U. S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$65.00/ —	$65.00/ —			
Soda, Bleached	120.00/ —	120.00/ —		Competitive	
Sulphate, Bleached	122.00/128.00	130.00/136.00	$125.00/128.00		
Sulphate, Unbl'd North'n	—	94.00/ 95.00	94.00/ —	with	
Sulphate, Unbl'd South'n	85.00/ —				
Sulphite Blchd. (S'ftw'd)	118.00/ —	118.00	118.00/ —	Domestic	
Sulphite, Blchd. (H'dw'd)	125.00/ —				
Sulphite, Unbleached				Grades	
Sulphite, Unbl'd (Glassine)					

WASTE PAPER MARKET

Prices to Mills. Quotations Nominal
F.O.B. Shipping Point (Per Ton)

	New York June 2	Philadelphia June 6	Boston June 11	Chicago June 6
No. 1 Mixed Paper	$4.00/ $5.00	$2.00/ $3.00	$4.00/ $6.00	$5.00/ —
Boxboard Cuts	6.00/ 7.00	3.00/ 4.00	— / 5.00	8.00/ —
Mill Wrappers	12.00/ 14.00	8.00/ 10.00	— / 9.00	7.00/ —
No. 1 News	7.00/ 8.00	5.00/ 7.00	— / 9.00	11.00/ —
Over-issue News	15.00/ 16.00	10.00/ 12.00	8.00/ 10.50	14.00/ —
Corrugated Containers	7.00/ 9.00	7.00/ 8.00	8.00/ 10.50	12.00/ —
New Corrugated Cuts	15.00/ 16.00	18.00/ 20.00	16.00/ —	15.00/ —
Double Kraft Ld. Corr. Cuts	22.50/ 25.00	25.00/ 30.00	25.00/ —	30.00/ —
Used Kraft Bags	25.00/ —	15.00/ 17.00	25.00/ 30.00	20.00 —
No. 1 Brown Kraft Paper	nominal	20.00/ —	25.00/ —	15.00/ —
Super Resorted Br. Kraft	25.00/ 30.00	30.00/ —	40.00/ —	30.00/ —
New Br. Kraft Env. Cuts	60.00/ 65.00	60.00/ 65.00	60.00/ 65.00	50.00/ —
New Br. Kraft Cuts	40.00/ 45.00	55.00/ —	45.00/ —	50.00 —
No. 1 Gdwd. Shvs.	20.00/ 25.00	12.00/ 15.00	25.00/ —	21.00/ —
White Newsblanks	45.00/ 55.00	60.00/ 65.00	/ 50.00	30.00 —
No. 1 Flyleaf Shvs.	25.00/ 30.00	15.00/ 20.00	35.00/ 40.00	30.00/ —
No. 1 Soft Wht. Shvs.	65.00/ 70.00	60.00/ 65.00	70.00/ 80.00	55.00/ —
Super Soft Wht. Shvs.	85.00/ 90.00	65.00/ 70.00	80.00/100.00	65.00/ —
Hd. Wht. Shvs.	80.00/ 85.00	70.00/ 75.00	80.00/ —	80.00/ —
Hd. Wht. Env. Cuts.	95.00/100.00	90.00/ 95.00	90.00/105.00	90.00/ —
New Manila Env. Cuts.	60.00/ 70.00	60.00/ 65.00	60.00/ 70.00	55.00/ —
Col. Tab Cards	25.00/ 30.00	25.00/ 30.00	— / —	30.00 —
Manila Tab Cards	60.00/ 65.00	55.00/ 60.00	65.00/ 75.00	50.00/ —
No. 1 Mixed Ledger	27.50/ 30.00	20.00/ —	37.50/ —	30.00/ —
White Ledger	35.00/ 40.00	30.00/ 32.50	45.00/ 50.00	40.00/ —
Mixed Books & Mags.	7.00/ 8.00	4.00/ 5.00	12.00/ —	5.00/ —
No. 1 Rep'd Hvy. Books & Mags.	15.00/ 17.00	8.00/ 10.00	22.00/ 23.00	20.00/ —

*** Twines**

All Prices Nominal, F.o.b. Mill

(Soft Fiber)

Coarse Polished—India	.35½/ .36½
Fine Polished India	.41½/ .45
Unpolished—Paper Makers	.32½/ .34½
Tube Rope	.33½/ .35½
Wrapping	.36 / .38¾
Cotton	.58 / .60
Polished Cotton	.55 / —

(Hard Fiber)

Mex. Sisal	.21 / .27

(American Hemp)

Polished Hemp	.45 / .48
Unpolished	.35 / .37½

Rag Market

New Domestic Cotton Cuttings

(Prices to Dealers, F.o.b. Ship. Pt.)

	Per 100 lbs.
White Shirt	$10.00/ $10.50
Unbleached Muslin	10.00/ 10.50
Light Silesias	7.00/ 7.50
White Back Blue Overalls	6.25/ 6.50
Blue Overalls	6.00/ 6.25
Fancy Shirt	4.50/ 5.00
Percales	5.50/ 6.00
Light Prints	5.50/ 6.00
No. 1 Washables	2.75/ 3.00
Bleachable Khaki	5.00/ 5.50
Unbleachable Khaki	4.50/ 5.00
Cottonades	4.25/ 4.75
Lt. Flannelettes	7.00/ 7.50
Men's Corduroy	3.50/ 4.00
Women's Corduroy	3.00/ 3.50

Old Domestic Cotton Rags

(Prices to Dealers, F.o.b. Ship. Pt.)

	Per 100 lbs.
No. 1 Whites, Repacked	$4.25/ $4.75
No. 1 Whites, Miscellaneous	3.50/ 4.00
No. 2 Whites, Repacked	2.75/ 3.00

HEAVY PLATE FABRICATORS FOR INDUSTRY

...that's Biggs

BIGGS MADE . . . 14-ft. diameter welded rotary digester

PRESSURE VESSELS TO MEET EVERY REQUIREMENT

The pulp and paper industries rely on equipment "built by Biggs". This is a logical outcome of our half-century of specialized experience in heavy plate assemblies, and our progressive research in fabricating with Nickel, Monel, Inconel, Stainless Steel, as well as all clad metals — to lengthen life of equipment and safeguard products.

Biggs' modern and complete plant facilities and long technical experience are yours to command or consult . . . Simply write, phone or wire the Akron Office. Our field representative will call to discuss your problem of fabrication for your requirements.

The Biggs Boiler Works Co. Akron Ohio Est. 1887

WELDED PRODUCTS BY BIGGS TO CODE REQUIREMENTS

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CARBON STEEL • SPECIAL STEEL SPECIAL ALLOYS and CLAD METALS

258-249-52

THE BIGGS BOILER WORKS COMPANY 1001 Bank Street, Akron 5, Ohio

There could not be a finer Chest than this -

One of the Many Uses for KALAMAZOO Glazed Tile

Here is a Kalamazoo Glazed Tile chest in process of construction. It is built of smooth, Kalamazoo Glazed tile with a solid, reinforced concrete core and designed for the installation of deckers on top.

Tanks can be made to any design with sloping floors and rounded corners. The ideal material for stock tanks or chests because of its permanent, long-lasting, easy-to-keep-clean surface. Far superior to concrete because there is no chipping or flaking. Standard construction in most modern paper mills.

KALAMAZOO TANK & SILO CO.

K A L A M A Z O O 1 6 , M I C H .

TITANOX-A-WD

assures

high **OPACITY** lasting **BRIGHTNESS** normal **STRENGTH**

. . . in beater-pigmented papers

The use of TITANOX-A-WD improves beater-pigmented paper three ways:

Imparts High Opacity—TITANOX-A-WD imparts the desired degree of opacity to beater-pigmented paper at relatively low loadings. This pigment prevents the overloading of light-weight papers which may occur with lower opacity fillers.

Promotes Lasting Brightness—The initial high brightness and whiteness secured through this pigment are retained because TITANOX-A-WD is not only color stable but almost masks after-yellowing.

Maintains Strength — The addition of abnormally high amounts of ordinary mineral filler to secure comparable opacity often weakens the paper. The relatively small amount of TITANOX-A-WD necessary for a given level of opacity does not affect the normal strength of the paper.

Our Technical Service Laboratory is available to help you to improve your paper with TITANOX-A-WD. Write or phone our nearest office. Titanium Pigment Corporation, 111 Broadway, New York 6, N.Y.; 104 South Michigan Avenue, Chicago 3, Ill.; 2600 South Eastern Avenue, Los Angeles 22, Calif. Branches in all other principal cities.

®**TITANOX**

the brightest name in pigments

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

7603

No. 2 Whites, Miscellaneous	2.00/ 2.25
Cotton Pants & Overalls	2.50/ 2.75
Thirds and Blues, Repacked	2.00/ 2.25
No. 1 Roofing Rags	1.35/ 1.35
No. 2 Roofing Rags	1.00/ 1.20
No. 3 Jute Bagging	.95/ 1.05
No. 4 Brussels & hrd. Bck'd srpts.	.90/ 1.00
Roofing Bagging	.80/ .95

New Foreign Cotton Cuttings
(Prices to Dealer, F.o.b. Dock, N. Y.)

	Per 100 lbs.
New Dark Cuttings	
New Mixed Cuttings	
Light Silesias	prices
Light Flannelettes	
New White Cuttings	are
New Unbleached Cuttings	
Fancy Shirt Cuttings	nominal
Light Prints	
Bleachable Khaki, No. 1	
Unbl. Khaki, No. 1	

Old Foreign Rags
(Prices to Dealer, F.o.b. Dock, N. Y.)

	Per 100 lbs.
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	prices
Extra Light Prints	
Old Light Prints	
Med. Light Prints	are
Dutch Blue Cottons	
Checks and Blues	
Linsey Garments	nominal
Dark Cottons, European	
Dark Cottons, Egyptian	
Old Shopperies	
New Shopperies	

Bagging
(Prices to Dealers, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny, No. 1	**$7.50/ $8.00**
Domestic Gunny, No. 1	7.50/ 8.00
Heavy Wool Tares	6.50/ 7.00
No. 1 Scrap Bagging	**4.75/ 5.00**
Foreign Manila Rope	**5.50/ 5.75**
Domestic Manila Rope	**5.50/ 5.75**
Jute Strings	**6.25/ 6.50**
No. 1 Sisal Strings	5.00/ 5.25
Mixed Strings	**1.15/ 1.30**

PHILADELPHIA

Domestic Rags (new)
(F.o.b. Eastern Shipping Point)

	Per 100 lbs.
White Shirt	**$10.25/$10.50**
Fancy Shirts	5.00/ 5.25
Light Silesias	**6.75/ 7.00**
Unbleached Muslin	**10.00/ 10.25**
Light Prints	**5.25/ 5.50**
Washable No. 1	2.75/ 3.25
Blue Overall	**6.00/ 6.25**
Percales	**5.50/ 5.75**
Unbleachable Khaki	3.50/ 4.00
Bleachable Khaki	4.50/ 5.00
Men's Corduroy	3.75/ 4.25
Ladies' Corduroy	3.25/ 3.75
Cottonades	3.75/ 4.00

Domestic Rags (old)
(F.o.b. Eastern Shipping Point)

	Per 100 lbs.
Mixed White	$3.00/ $3.50
Thirds and Whites Repacked	2.40/ 2.50
Cotton Pants & Overalls	2.75/ 3.00
No. 1 Roofing Stock	1.05/ 1.15
No. 2 Roofing Stock	.95/ 1.05
Roofing Bagging	.75/ .90

Bagging
(F.o.b. Eastern Shipping Point)

	Per 100 lbs.
Old Manila Rope	$5.50/ —
Foreign Gunny No. 1	**8.00/ —**
Domestic Gunny No. 1	**8.00/ —**
Sisal Strings No. 1	5.50/ —
No. 1 Scrap	4.50/ 5.00
No. 1 Jute Rope	6.00/ —

BOSTON

Bagging
(F.o.b. Boston)

	Per 100 lbs.
Foreign Gunny	7.50 / 8.00
Domestic Gunny	8.00 / 8.50
Domestic No. 1 Old Rope	6.00 / 6.25
Foreign No. 1 Old Rope	**6.50 / —**
Mixed Strings	1.40 / —
Transmission Rope—Domestic	3.00 / 3.50
Jute Carpet Threads	— / 4.00
Bleachery Burlap	— / 9.00
Scrap Burlap—	
Foreign	6.00 / 6.50
Domestic	6.00 / 6.50
South America	6.00 / 6.50
Austr. Wool Pouches	8.25 / —
New Zealand Wool Pouches	— / 6.00
New Burlap Cuttings	8.50 / —
Heavy Baling Bagging	7.50 / 8.00
Paper Mill Bagging	— / 5.00

Domestic Rags (new)
(F.o.b. Boston)

	Per 100 lbs.
New Light Prints	5.75 / 6.00
Fancy Percales	6.00 / 6.25
White No. 1 Shirt	10.00 /10.75
Light Flannelettes	**— / 7.00**
Canton Flannels, Bleached	**— / 9.00**
Underwear Cutters, Bleached	10.75 /11.00
Underwear Cutters, Unbleached	10.00 /10.25
Blue Overalls	6.25 / 6.75
Soft Unbleached	10.00 /10.75
Blue Cheviots	6.00 / 6.75
Fancy Shirt	4.00 / 4.50
Washable	3.25 / 3.50
Khaki Cuttings	5.00 / 5.25
Men's Corduroy	4.50 / —
Khaki Canvas	— / 5.50
B. V. D. Cuttings	10.00 /10.25

Domestic Rags (old)
(F.o.b. Boston)

	Per 100 lbs.
No. 1 Whites, Repacked	$3.50 /$4.00
No. 1 Whites, Miscellaneous	3.00 / 3.50
Twos and Blues, Repacked	— / 2.00
Cotton Pants & Overalls	2.50 / 2.75
No. 1 Roofing Stock	— / 1.20
No. 2 Roofing Stock	— / 1.10
Roofing Bagging	— / .90

MARKETS

Blanc Fixe

Prices firm. Demand moderate. Supply adequate. Currently quoted at $85.00 in bags, car lots, at works, 6 cents per pound, l.c.l., deld. By-product supply somewhat restricted. Quoted at $77.50 per ton, car lots, at works, 6 cents per pound, l.c.l., deld.

Bleaching Powder

Demand and prices steady. Steady improvement in supply. Prices range from $4.25 to $4.75 per 100 pound drums, l.c.l., works.

Casein

Prices nominal. Market inactive. Buying dull. Current prices on processed acid precipitated casein at 19 to 21 cents per pound for domestic grades and 18½ to 19 cents for imported grades, f.o.b. shipping point, car lots.

Caustic Soda

Carload prices firm. Supplies available for prompt shipment. L.c.l. sales reported at competitive levels. Solid caustic is reported at $3.05 per cwt. flaked and ground is quoted at $3.45 per cwt., in 400 pound drums, $3.95 per cwt. in 100 pound drums—car lots at works; liquid 50 percent in tank cars at $2.40 per cwt.; liquid 73 per cent in tank cars at $2.50 per cwt., at works.

China Clay

Prices firm. Demand easier, supply of domestic and imported ample. Domestic filler quoted at $10 to $12.50 per ton, car lots, f.o.b. mines. Coating clay is $15 to $25. Imported clay quotation, short tons, $16 to $35, export warehouse.

Chlorine

Prices firm. Supply condition favorable. Demand moderately strong. Currently quoted at $2.40 per cwt. in single unit tank cars; at $2.70 to $3.90 per cwt. in multi-tank cars, f.o.b., works.

Rosin

Export business firms market. Prices rise 3c. Gum rosin in drums per 100 pounds net in car lots, f.o.b. Savannah, B, $5.75; G, H, I, K, $6.43, Savannah; B, $4.25; FF, $5.50.

Rosin Size

Supply good. Demand steady. Seventy percent gum and pale wood grades, tank cars, $5.45 to $5.55 f.o.b. southern shipping point.

Salt Cake

Demand moderate. Price steady. Domestic quoted at $24.00/$25.75, f.o.b. shipping point, freight allowed to destination.

Soda Ash

In free supply. Demand easier. Carload prices firm. Some competitive cutting noted in l.c.l. lots. Current prices, car lots per 100 pounds; in bulk, $1.15; in paper bags, $1.40; and in barrels, $1.90.

Starch, Corn

Demand fair. Supply ample. Pearl grade currently quoted at $4.82 per 100 pounds; powdered starch at $4.93 per 100 pounds; car lots, f.o.b. Chicago.

Starch, Potato

Paper mill demand slightly easier. Idaho quantities limited to warehouse. High grade quoted at $7.00 cwt., l.c.l., ex. N. Y. whse Large Maine supply quoted $4.75 f.o.b. Maine warehouse; pearl grade, $4.60 cwt. f.o.b. Maine.

Sulphate of Alumina

Prices firm Supply good. Demand steady. The commercial grades are quoted from $1.50 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is $2.50 per 100 pounds in bags, car lots, at works.

Sulphur

Prices firm. Demand sustained at good level. Supply good. Annual contracts are quoted at $18 per long ton, f.o.b. mines; $19.50, f.o.b. vessels, Gulf ports. Export price f.o.b. Gulf ports is $22.00 per long ton.

Talc

Prices steady. Demand continues ahead of supply. Domestic grades are currently quoted at $23 per ton in paper sacks, f.o.b. mills; Canadian at $35 and up per ton. All prices in car lots.

Tapioca Flour

Supplies tight on all grades. Inquiry good for new Brazilian crop. Price looks slightly easier. Superior high range from $10.50/$11.50 cwt.; high grades $9.50 cwt., on dock Atlantic and Gulf ports; medium grades range from $6.65/ $7.50 cwt. on dock, N. Y.

Titanium Dioxide

Prices firm. Supply reported now in balance with eased demand. Anastase 19½c pound carload lots, 20c l.c.l., rutile, 21½c pound carload lots, 22½c l.c.l.; 50-pound bags, f.o.b. plant, actual freight allowed.

Pulp, Paper and Board Industry Report

By W. LE ROY NEUBRECH
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Office of Domstic Commerce,
Forest Products Division.

Lower prices, higher qualities, improved services, better discount periods and rates, and other similar keen competitive business practices dominate the recent and current pulp, paper, board, and products trade.

When conditions in the paper, board, and allied products industries are compared with a bird's eye view of the over-all national economy, there is a striking similarity. Their present status is apparently closely associated with trends in the entire industrial economy.

The persistent decline in industrial prices is reported to be the principal factor causing caution in the Nation's business picture. During May prices on commodities other than farm and food prices fell for the sixth consecutive month.

Perhaps many grades of paper were among some of the last commodities to react to substantial price reductions at the manufacturing level. According to Department of Commerce Field Office

When you regrind rolls with this machine . . . you can DEMAND ACCURACY

Use of the Farrel Two-Wheel, Swing-Rest Roll Grinder permits management to set definite standards of accuracy and uniformity, and then insist that they be adhered to faithfully and reproduced on any number of rolls.

This is possible because, in designing the machine, much of the skill formerly supplied by the operator was transferred to the mechanism. The necessity for "cut-and-try" methods has been eliminated.

The exclusive swing-rest principle, with the use of two grinding wheels of large diameter, reduces to a minimum the minor inaccuracies imparted to the roll when grinding with any fixed-rest machine.

The patented crowning device, which can be quickly set, produces exactly the crown desired without any manipulation on the part of the operator. The same setting of the device produces identically the same crown for a definite roll length.

Well known throughout the paper industry for many years, the Farrel swing-rest machine has recently been redesigned to provide faster grinding and finer finishes, with even closer control of roll accuracy and crown shape. Available in two sizes for roll diameters up to 32" and 42", any length required.

Complete information furnished on request, without obligation.

FARREL ROLLS

Farrel rolls are made in sizes from 5" to 72" in diameter and up to 312" in face length. They are available in the following types:

Made of Chilled Iron, Gray Iron, Meehanite, Alloy Iron Steel, Chromium-Plated.

- Calender Stock Rolls
- Board Calender Rolls
- Super Calender Rolls
- Glassine Calender Rolls
- Friction Rolls
- Breaker Rolls
- Smoothing Rolls
- Coating Rolls
- Creping Rolls
- Cutting Rolls
- Paraffining and Waxing Rolls
- Saturating Rolls
- Silicating Rolls
- Rolls for Miscellaneous Special Purposes

Farrel-Birmingham

reports, paper mill price reductions, which were first generally noticeable the latter part of March and through April, continued during May and early June, so that strong price competition now dominates the entire paper and converted products manufacturing field.

Similar to the prevailing situation in many other industries, there seems to be a general "wait and see" attitude on the part of paper and board distributors and converters, which has resulted in a slackening of orders and production of most grades at the mill level. While many consumers of goods in general probably have been influenced to postpone buying, awaiting possible still lower prices, the aggregate of retail sales on a dollar basis during the first 4 months of 1949 has remained steady, but about 4 percent lower on a seasonally adjusted basis than the postwar peak month of December 1948. This situation is reflected in lowered inventories of merchandise at the retail and wholesale level, particularly of nondurables, but with some additions noted in manufacturers' finished goods inventories.

Most noteworthy, however, in the pulp and paper field, as well as in many other industrial areas, is an underlying strength and stability which appears to be merely awaiting a solidification and confidence in the price structure from the manufacturer through to the ultimate consumer.

Index
Wholesalers' Sales & Inventories
Paper and Its Products

(Average month 1940 = 100)

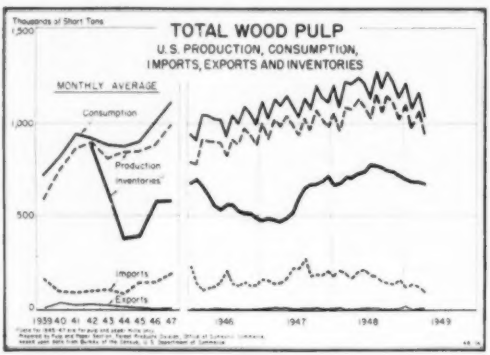
Item	1948	1949
Sales		
January	259.3	224.2
February	239.8	206.6
March	249.5	228.1
April	245.6	214.4
Inventories		
January	186.8	209.2
February	190.8	213.2
March	194.7	205.3
April	207.9	205.3

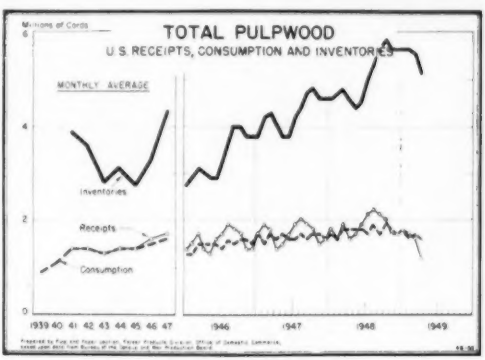
Source: Compiled by Pulp and Paper Section, Forest Products Division, Office of Domestic Commerce, based upon data from the Business Structure Division, U. S. Department of Commerce.

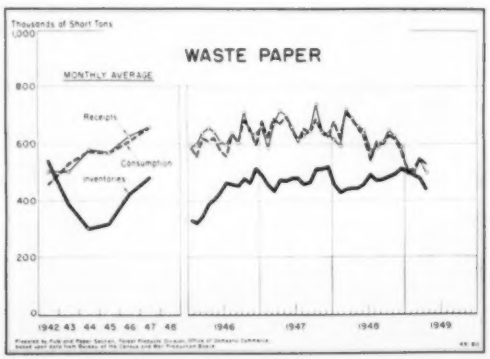
Some paper mill executives, according to Commerce Field Office reports, feel that prices have about reached rock bottom since there does not appear to be much likelihood of wage reductions or any further ways and means of reducing overhead and operating costs. Postwar modernization and new equipment are now in operation in most mills and not much more can be done to increase efficiency. On the other hand, those prewar marginal mills which did not follow the pattern of modernization are reported to be nearing the end of competitive existence. Some have already been discontinued. Also, the early postwar trend toward integration continues, with still more converter plants being purchased and operated by the larger paper or board mills. There has been little if any recent acquisition of paper or board mills by the consumer, as was evident immediately after the war when some publishers and other interests saw fit to acquire primary manufacturing units. In fact, that trend seems to have been reversed.

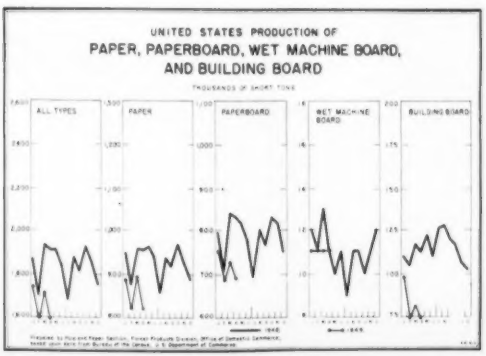
Numerous paper, board, and products mills are pressing their marketing and product research divisions for new fields and new items. Since the war many improved or new products have been introduced on the markets with good results. More companies appear interested in a larger variety of products with the hope that diversification will tend to balance off the impact of a decline in a single specialty field.

There is also hope in the packaging and printing fields that the new competition among various industries, goods, and services may strengthen, rather than weaken, the demand for new improved packages or wrappings, that more packaging will be used as sales appeal, and last, but not least, that advertising in magazines, newspapers and printed circulars will hold









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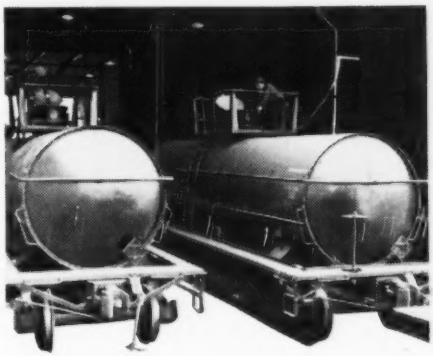


Wyandotte has recently completed the expansion of its Mercury Cell Chlorine production. This modern production method provides a raw material of highest quality in quantities sufficient to meet the exacting demands of the growing Paper Industry.

No matter what your Chlorine application may be, you can rely on Wyandotte for prompt, dependable tank-car shipments of this basic chemical—together with any technical assistance you may need.

SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA
CALCIUM CARBONATE • CALCIUM CHLORIDE • CHLORINE
HYDROGEN • DRY ICE • SYNTHETIC DETERGENTS • GLYCOLS
CARBOSE (Sodium CMC) • ETHYLENE DICHLORIDE • PROPYLENE
DICHLORIDE • AROMATIC SULFONIC ACID DERIVATIVES
OTHER ORGANIC AND INORGANIC CHEMICALS

Wyandotte
REG. U. S. PAT. OFF.

WYANDOTTE CHEMICALS CORPORATION
Wyandotte, Mich. • *Offices in Principal Cities*

steady or even increase to offset the current business slackening. The Printers' Ink index of advertising shows that April this year recorded a higher level of advertising in magazines, newspapers, and business papers with a lower level in radio and outdoor advertising, as compared with April 1948.

The downward trend in paper and board output continued through May and early June, Commerce Department Field Offices reported. For the first 4 months of this year Bureau of the Census data show production of all types at 10½ percent below the same period of a year ago, with paper down 9 percent, paperboard down 10½ percent, wet machine board down 12 percent and building board down 24 percent.

The manufacture of relatively higher quality paper also continues evident. Wood pulp consumption by paper and board mills declined less than 5 percent in the 1949 4-months' period compared with the same months of 1948. Waste paper consumption, on the other hand, dropped nearly 22 percent in a similar period comparison.

Domestic wood pulp production has shown a very steady trend, being only 2 percent less in the 4 months of 1949 than in the same period a year ago. This has been reflected in a falling off in imports, particularly from overseas. Also contributing to the dullness in the import pulp picture is the relatively greater degree of slackness in paper production by the nonintegrated pulp-purchasing paper mills. Wood pulp 1949 inventories, in total, have declined 5 percent at the end of April from April 1948. However, stocks relative to consumption have remained fairly constant.

Wholesale paper merchants' sales in April declined 6 percent below March and were about 13 percent less, on a value basis, than in April 1948. Allowing for some adjustment in terms of lower prices this year against a year ago would seem to indicate that actual physical volume was not down to the same degree. April month-end inventories showed no change from March, but were down 4 percent, on a value basis, from the end of February this year.

IMPORTS . . . . .

Week ending June 18

NEW YORK

Newsprint

Madden Reeve Angel & Co. Inc., Hamina, Kotka, 314 rolls.

News Syndicate Co., Spurt, Baie Comeau, 6303 rolls.

Gilman Paper Co., Tudor Prince, Cornerbrook, 84 rolls.

Wall Street Journal, Tudor Prince, Cornerbrook, 78 rolls.

N. Y. World Telegram, Tudor Prince, Cornerbrook, 1339 rolls.

Hearst Enterprises Inc., Tudor Prince, Cornerbrook, 742 rolls.

N. Y. Times Co., Tudor Prince, Cornerbrook, 548 rolls.

News Syndicate Co., Colabee, Baie Comeau, 7,942 rolls.

R. A. Olsen, G.D.D., Donnacona, 364 rolls.

H. G. Craig Co., A.C.D., Donnacona, 355 rolls.

News Syndicate Co., Ted, Thorold, 1813 rolls.

H. G. Craig Co., Donpaco, Donnacona, 359 rolls.

News Syndicate Co., Mimi, Thorold, 1651 rolls.

R. A. Olsen, Newscarier, Donnacona, 365 rolls.

News Syndicate Co., Ethel Tombs, Gatineau, 324 rolls.

R. A. Olsen, G.T.D., Donnacona, 380 rolls.

News Syndicate Co., Richard J. Barnes, Thorold, 1150 tons.

Wrapping Paper

Jay Madden Corp., Mormacmoon, Helsingfors, 404 rolls.

J. P. Heffernan Paper Co., Pres. Buchanan, Genoa, 105 bls.

Filter Paper

H. Reeve Angel & Co. Inc., American Clipper, London, 16 cs.

Drawing Paper

H. Reeve Angel & Co. Inc., American Clipper, London, 3 cs.

Printing Paper

Winsor Newton Inc., American Clipper, London, 1 cs.

S. H. Pomerance, Vandalia, London, 4 cs.

Photo Paper

J. J. Gavin & Co., Caronia, Southampton, 6 cs. (unsensitized).

Lep Transport Inc., Caronia, Southampton, 1 cs. (base).

E. I. DuPont de Nemours (Defender Division), Caronia, Southampton, 1 cs. (base).

Alco Photo Supply Corp., American Clipper, London, 2 cs. (base).

American Express Co., American Clipper, London, 60 drums (base).

Parchment

Meadows Wye & Co., Caronia, Southampton, 1 cs.

Intermaritime Forwardirg Co., Caronia, Southampton, 1 cs.

Stevens Nelson Paper Corp., American Clipper, London, 1 crate.

Tissue Paper

B. F. Drakenfeld & Co., American Manufacturer, Liverpool, 7 cs.

Gummed Paper

B. F. Drakenfeld & Co., American Manufacturer, Liverpool, 7 cs.

Wallpaper

Hudson Shipping Co., Washington, Havre, 1 cs.

E. Halle, Stockholm, Gothenburg, 3 cs (hangings).

Intramar Shipping Co., American Banker, Havre, 1 cs.

Tracing Cloth

Keuffel & Esser Co., American Traveler, Manchester, 17 cs (bleached cotton).

Boxboard

National City Bank, Hamina, Rauma, 201 rolls (bleached folding).

Rags, Baggings, Etc.

Castle & Overton, Inc., Clan MacBrayne, Cochin, 143 bls. old jute rags.

(———), Clan MacBrayne, Cochin, 150 bls. old jute rags.

(———), Gudrun Maersk, Antwerp, 64 bls. neperstock.

State Street Trust Co., Exchester, Venice, 54 bls. waste bagging.

National City Bank, Exchester, Genoa, 135 bls. old bagging.

Chase National Bank, Exchester, Genoa, 128 bls. old bagging.

E. J. Keller Co., Inc., Elin Horn, Antwerp, 80 bls. old bagging.

National City Bank, Elin Horn, Antwerp, 113 bls. old jute bagging.

A. de Vries Trading Corp., Elin Horn, Antwerp, 131 bls. scrap bagging.

Chase National Bank, American Manufacturer, Glasgow, 100 bls. old bagging.

(———), American Manufacturer, Glasgow, 100 bls. linen waste.

J. J. Rozendaal, American Banker, Dunkirk, 158 bls. cotton waste.

(———), American Banker, Dunkirk, 79 bls. cotton waste.

Chase National Bank, American Judge, Antwerp, 92 bls. bagging.

National City Bank, Exchange, Bombay, 175 bls. old jute rags.

Darmstadt Scott & Court, ey, American Traveler, Manchester, 76 bls. bagging.

Old Rope

(———), Steel Director, Calcutta, 115 bls. old hemp rope cuttings.

(———), Exchange, Calcutta, 121 bls. old hemp rope cuttings.

(———), American Manufacturer, Glasgow, 93 coils, 48 bls. old rope.

(———), City of Carlisle, Calcutta, 169 bls. old hemp rope cuttings.

China Clay

J. W. Higman, Wells City, Avonmouth, 312 tons, 10 cwt.

Casein

American Cyanamid Co., Brazil, Buenos Aires, 1500 bags.

American British Chemical Supplies, Brazil, Buenos Aires, 600 bags (lactic).

The Borden Co., Chemical Division, Brazil, Buenos Aires, 300 bags.

Crawford Keen Co., Brazil, Buenos Aires, 3000 bags.

Woodpulp

Stora Kopparberg Corp., Stockholm, Gothenburg, 1 ble.

Fagel Horton & Co. Inc., Stockholm, Gothenburg, 1 cs.

Cellulose Sales Co., Stockholm, Gothenburg, 1 ple. (samples).

Woodpulp Boards

National City Bank, Hamina, Rauma, 102 bls. (solid white).

National City Bank, Hamina, Kotka, 545 bls., 339 rolls (solid white).

PHILADELPHIA

National City Bank, Hamina, Rauma, 68555 bls. prime strong bleached sulphite pulp, 200 bls. prime extra strong unbleached sulphite pulp.

Pulp Sales Corp., Hamina, Rauma, 530 bls. prime strong unbleached sulphite pulp, 630 bls. prime strong bleached sulphite pulp.

Madden Reeve Angel & Co. Inc., Hamina, Kotka, 136 rolls newsprint.

Pulp Sales Corp., Hamina, Kotka, 170 bls. prime unbleached grease-proof sulphite pulp, 1835 bls. prime unbleached kraft sulphate pulp, 592 bls. prime extra strong bleached sulphite pulp, 2120 bls. prime strong unbleached sulphate pulp, 520 bls. prime strong unbleached sulphite pulp, 262 bls. prime extra strong unbleached sulphite pulp.

BALTIMORE

J. J. Rozendaal, American Banker, Dunkirk, 120 bls. bagging.

Pulp Sales Corp., Hamina, Rauma, 520 bls. prime strong unbleached sulphite pulp, 520 bls. woodpulp.

Pulp Sales Corp., Hamina, Kotka, 125 bls. prime bleached sulphite pulp, 2695 bls. prime strong unbleached sulphite pulp.

NORFOLK

F. P. Gaskell & Co., American Manufacturer, Glasgow, 75 cs. coated paper (for cigarette tipping).

Dixie Jute Bagging Co., American Traveler, Manchester, 155 bls. old bagging.

Loumar Textile By Products Co., American Traveler, Manchester, 88 bls. old bagging.

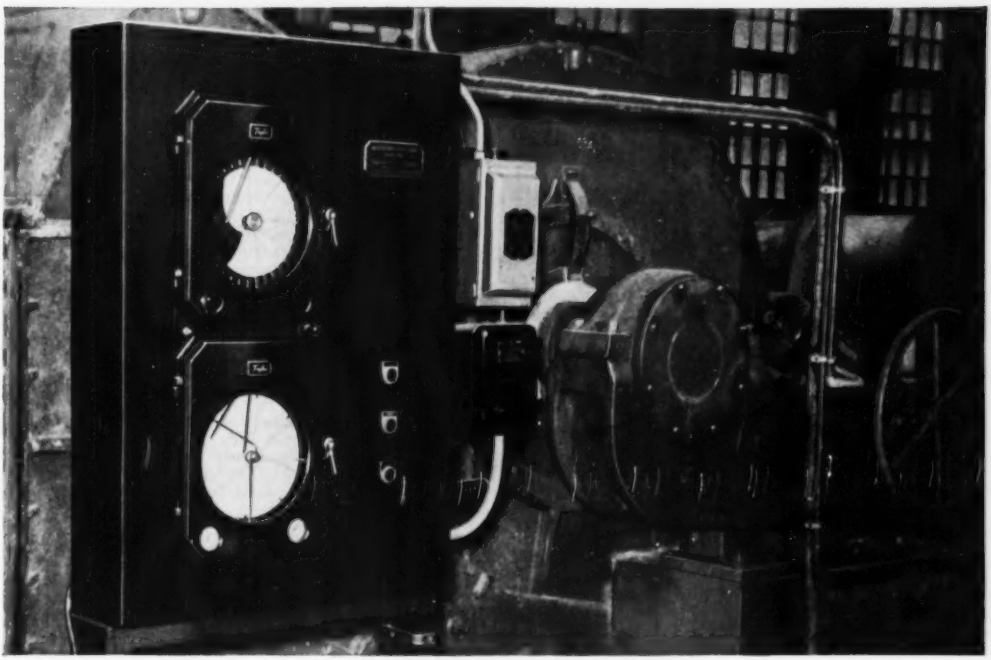
(———), City of Carlisle, Aden, 50 bls. old rags.

BOSTON

Gottesman & Co., Svaneholm, 1000 bls. bleached sulphite pulp.

BIG INVESTMENT PAYS OFF

when you make a small investment in Taylor Beater Roll Pressure Control!



YOUR stock beater is one of your more expensive processing units. But it can pay for itself in increased beating capacity, and higher-quality, lower-cost finished sheets IF you can keep close accurate tabs on beater roll pressures.

You can do this by making a very small investment in a Taylor Beater Roll Pressure Control System. Over 500 Taylor Beater Roll Pressure Installations are now turning out uniform stock for more than fifty different grades and types of paper. Here's what superintendents say about it:

"Uniformity of the beaten stock . . . is very noticeable on the paper machine. The drying pressure remains nearly constant."

"Our Taylor Beater Roll instruments have been in use for over a year. Our operators are able to obtain greater beating precision. It is now possible to duplicate previous satisfactory results . . . something that was difficult to do previous to the use of the instrument."

"I would not think of starting up this new beater without your beater roll pressure recorder."

"We now depend entirely on your instruments for proper control of our beaters."

Whether you use Beater Roll Pressure Control or a simple recorder, Taylor's principle of beater roll pressure measurement is time proven, simple and dependable. Another of the many ways we can help you keep quality up and costs down. Ask your Taylor Field Engineer or write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

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Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.

TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

FINANCIAL RECORD

PREFERRED STOCKS	Per Share Earnings Calendar Year 1948	Per Share Earnings 12 Mo. to Approx. 3/31/49	Indic. Annual Divid. Rate	June 21 Approx Market Price
Armstrong Cork Co. $3.75 Cum.	$46.33*	$46.33*	$3.75	94⅜
Armstrong Cork Co. $4.00 Cum. Conv.	46.33*	46.33*	4.00	106
Celotex Corp. 5% Cum.	26.42c	15.31i	1.00	15¾
Champion Paper & Fibre $4.50 Cum.	61.80j	61.80j	4.50	91¾
Container Corp. of Amer. 4% Cum.	105.41	104.24	4.00	95½
Crown Zellerbach $4.20 Cum.	56.40f	63.54g	4.20	96¼
Crown Zellerbach $4.00 Cum. Conv. 2nd	53.96f*	60.21g*	4.00	90
Dixie Cup Co. $2.50 Cum. Conv. Cl. A	10.10	11.71	2.50	46¼
Flintkote Co. $4 Cum.	83.25	74.66	4.00	98⅞
Robert Gair Co., Inc. 6% Cum.	17.08	15.96	1.20	14⅞
International Paper Co. $4 Cum.	263.00	265.18	4.00	95
Johns-Manville $3.50 Cum.	209.89	217.72	3.50	105⅛
Kimberly Clark Corp. 4½% Cum.	80.74	77.94	4.50	104
Kimberly Clark Corp. 4% Cum. Conv. 2nd	41.59*	46.40	4.00	90¼
MacAndrews & Forbes 6% Cum.	62.23	62.60	6.00	134½
Mead Corp. 4¼% Cum.	73.46	71.12	4.25	72
Mead Corp. 4% Cum. Conv. 2nd	29.91*	28.84*	2.00	29⅜
Paraffine Cos. Inc. 4% Cum. Conv.	156.11	158.51	4.00	103⅝
Rayonier Inc. $2 Cum.	16.43	15.72	2.00	28¼
St. Regis Paper Co. 4.40% 1st A	79.90	68.10	4.40	82
Scott Paper Co. $3.40 Cum.	59.06	66.09	3.40	90½
U. S. Gypsum Co. 7% Cum.	314.45	314.18	7.00	180
United Wallpaper Inc. 4% Cum. Conv.	(d)0.79	15.44	2.00	24
West Virginia Pulp & Paper 4½% Cum.	79.45c	77.54i	4.50	104¾

COMMON STOCKS				
APW Products Co.	$0.73	$0.22	$0.25	2¾
American Writing Paper Corp.	(d)0.15	(d)0.15	0.25	5½
Armstrong Cork Co.	7.54	n.a.	3.00	40¾
Celotex Corp.	7.21c	4.06i	1.00	14⅜
Certain-Teed Prods. Corp.	4.02	3.57	1.00	10
Champion Paper & Fibre	5.57f	6.09j	2.00	19⅝
Congoleum Nairn Co.	5.78	n.a.	2.25	25⅛
Container Corp. of America	10.12	9.98	4.50	28¼
Crown Zellerbach	6.81f	7.26g	2.00	22⅞
Dixie Cup Co.	6.70	8.11	1.00	24½
Eastern Corp.	4.76	3.10	1.00	8¾
Flintkote Co.	5.86	5.13	2.50	23½
Robert Gair Co., Inc.	2.67	2.48	0.70	5
Great Northern Paper Co.	4.63	5.12	2.80	32⅜
International Paper Co.	16.73	16.87	5.00	44⅞
Johns-Manville Corp.	5.22	5.42	2.00	33½
Kimberly Clark Corp.	5.02	4.83	1.65	18⅝
MacAndrews & Forbes Co.	3.68	3.70	2.50	31⅞
Marathon Corp.	4.11c	3.76i	1.40	18
Mead Corp.	6.36	6.10	2.00	13½
National Container Corp.	2.28	1.80	0.40	5⅛
Paraffine Cos. Inc.	2.45	2.49	1.20	15¾
Rayonier, Inc.	9.09	8.64	2.00	21⅛
Ruberoid Co.	11.80	9.87	3.25	45⅛
St. Regis Paper Co.	2.71	2.27	0.80	6⅝
Scott Paper Co.	4.15	4.68	2.50	52½
Sutherland Paper Co.	6.02	5.24	2.50	30⅝
Union Bag & Paper Corp.	9.17	8.21	3.50	20⅝
United Board & Carton	4.95b	(d)0.35i	(e)	4⅝
U. S. Gypsum Co.	15.04	15.03	6.00	92
United Wallpaper	(d)0.10	0.42	(n)	3
West Virginia Pulp & Paper	11.33c	10.93i	4.00	36⅜

(b) Year ended 5/30/48
(c) Year ended 10/30/48
(d) Deficit
(e) Omitted dividend 2/4/49
(f) Year ended 4/30/48
(g) 12 months to approximately 1/31/49
(i) 12 months to approximately 4/30/49
(j) 8 months to 12/31/48
(n) Last payment 25c, 9/16/47
n.a. Not available

(*) Earnings per combined preferred shares.

Dividends Declared

Minnesota & Ontario Paper Co. has declared a dividend of 25 cents per share, payable July 20 to holders of record June 30.

Great Lakes Paper Co. has declared a dividend of 25 cents a share on its common shares for June as against payment of 40 cents a share on March 31 and quarterly since the last quarter of 1947. It also declared a regular 62½ cents a share on its preferred A, and 30 cents a share on its preferred B, all payable June 30 to holders of record June 10.

Puget Sound Pulp & Timber Co. has declared a dividend of 50 cents a share on its common stock, payable June 30 to holders of record June 17.

Celanese Corp. of America has declared a dividend of 60 cents per share on its common stock, payable June 30, to holders of record June 17. At the same time the board voted regular quarterly dividends for the current quarter of $1.18¾ on the first preferred stock, $4.75 series, and $1.75 per share on the seven percent second preferred stock, both payable July 1 to holders of record June 17.

Scott Issue Quickly Subscribed

PHILADELPHIA — Subscription books were closed June 15 on an offering of 45,000 shares of $4 cumulative preferred, without par, of the Scott Paper Co., at $102.50 a share. The offering was made by an underwriting group headed jointly by Drexel & Co., Smith, Barney & Co., and Merrill Lynch, Pierce, Fenner & Beane.

Of the proceeds, $2,000,000 will be used to repay in full outstanding bank loans, and the remainder will be added to the Scott company's general funds.

The 45,000 new shares are part of an authorized issue of 150,000 cumulative preferred shares. The company also has outstanding 871,847 shares of common stock.

The new shares are redeemable at $105½ on or before December 31, 1951; at $104½ thereafter and on or before June 30, 1954; at $103½ thereafter and on or before December 31, 1956; and at $102½ thereafter.

Associated in the offering are First Boston Corp., Harris, Hall & Co., Inc., Dean Witter & Co., Janney & Co., W. H. Newbold's Son & Co., Yarnall & Co., and Boenning & Co.

Redeeming Abitibi Preferred Issue

TORONTO—At a meeting of the board of directors of Abitibi Power & Paper, Ltd., it was decided to redeem the outstanding 50,000 prior preferred shares of the company.

The prior preferred shares, par value $20, provide for an annual cumulative dividend of $2.50, and are redeemable at $37.50 a share, plus accrued dividend. Redemption will be made as of August 1 next.

Canadian March-April Equities

OTTAWA — The Canadian Government reports that prices of common stock securities in the pulp and paper industry dropped from 236.7 in March to 234.2 in April for a loss of 2.5, with the principal price changes in this period including increases for Howard Smith and decreases for Dryden Paper and Hinde & Dauch. The index is based on 1935-1939 being equal to 100.

Mersey on Montreal Curb

MONTREAL — Mersey Paper Co. npv common shares have been admitted to trading on the Montreal Curb Market. The listing covers a total of 198,292 shares.

APPLETON
FELTS
FOR DESIGN AND FINISH!
FOR UNIFORMITY!
FOR SERVICE!
FOR DEPENDABILITY!
STANDARD
APPLETON
FELTS
AMERICAN WOOL
AMERICAN LABOR
AMERICAN F.E.L.T.S
APPLETON, WIS.
make
APPLETON FELTS
good
paper
APPLETON WOOLEN MILLS
APPLETON, WISCONSIN

AMERICAN PAPER AND PULP ASSOCIATION'S PRODUCTION RATIO REPORT*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current weeks—1949		Corresponding Weeks—1948	
May 7	84.6	May 8	102.4
May 14	82.4	May 15	100.4
May 21	80.2	May 22	100.3
May 28	83.2	May 29	98.9
June 4 (Revised)	79.7	June 5	92.9
June 11	*83.8	June 12	*95.0

* Capacity in Tons—179,776. * Capacity in Tons—179,802.

COMPARATIVE MONTHLY SUMMARIES

1948		May	100.5	Oct.	99.1	1949	
Jan.	100.1	June	95.7	Nov.	97.1	Jan.	94.6
Feb.	99.8	July	85.3	Dec.	87.1	Feb.	93.8
Mar.	100.8	Aug.	96.8			Mar.	89.1
Apr.	100.8	Sept.	91.8	Year Avg.	96.2	Apr.	85.1
						May	‡82.6

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1942	1943	1944	1945	1946	1947	1948	1949
Year to Date	99.7	88.8	88.6	88.9	100.2	105.5	100.1	88.4
Year Average	90.4	87.8	88.1	89.4	101.1	104.3	96.2	

PAPERBOARD OPERATING RATIOS†

Current weeks—1949		Corresponding Weeks—1948	
May 7	78	May 8	101
May 14	79	May 15	100
May 21	77	May 22	100
May 28	77	May 29	100
June 4	65	June 5	87
June 11	79	June 12	101

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1948	99	100	102	102	100	94	81	92	91	96	94	84	95
1949	88	85	79	79	78								

* All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

BIDS—AWARDS • • •

GPO 3rd Quarter, 1949 Paper Needs

WASHINGTON — Bids were received on June 6 by the Joint Congressional Committee on Printing for paper for the use of the Government Printing Office for a three months' period beginning July 1, 1949. Awards, announced June 13, are indicated by asterisks (*) before the names of the successful bidders in the tabulation herewith.

The committee awarded contracts on 101 lots of paper for the quarter beginning July 1, 1949, for a total quantity of 29,759,000 pounds, at a value based on new prices of $2,803,322.25.

No awards were made on lots 304 and 305 totaling 30,000 pounds, because the only bids received were said to be not in accord with specifications; however, the Committee reports, "the coverage of the total quantity requested by the Public Printer was 99.9 percent, the highest coverage obtained since prior to World War II."

The value of the schedule, based on the new prices, it was added, represents a decrease of four percent, or $116,000.50, the fifth successive quarter during which price decreases have been recorded.

Newsprint

No. 1—1,000,000 lbs., 24x36—64; rolls, 19, 24, 36, and 48 in. wide, 36 inches in diameter (3-inch fiber cores).

Great Northern Paper Co.	.05025c
Bermingham & Prosser Co.	.055c
*Walker, Goulard Plehn Co.	.0449c
Stanford Paper Co.	.0505c

Machine-Finish Book

No. 3—425,000 lbs., 25x38—70; flat, cut any size, min. 21 ins., max. 48 ins.

Mead Sales Co., Inc.	.1041c
Mudge Paper Co. (160,000 lbs. only.)	.104c
Butler Co.	.0922c
*Walker, Goulard Plehn Co.	.0847c
Barton, Duer & Koch Paper Co.	.1011c
Frank Parsons Paper Co.	.1139c
Paper Corp. of U. S.	.104c

No. 4—800,000 lbs., 25x38—70; flat, cut 24x38, 28x38, and 38x48 ins.

Mead Sales Co., Inc.	.1041c
Mudge Paper Co.	.104c
Butler Co.	.0922c
*Walker, Goulard Plehn Co.	.0847c
Barton, Duer & Koch Paper Co.	.1011c
Stanford Paper Co.	.1166c
Frank Parsons Paper Co.	.1139c
Paper Corp. of U. S.	.104c

No. 7—600,000 lbs., 25x38—70; rolls, 19, and 38 ins. wide, 36 ins. in diameter (3-inch fiber cores).

Bermingham & Prosser Co.	.083c
Mead Sales Co., Inc.	.0918c
Mudge Paper Co. (400,000 lbs. only.)	.0965c
Wilcox, Walter Furlong Paper Co.	.08234c
*Walker, Goulard Plehn Co.	.0809c
Barton, Duer & Koch Paper Co.	.0922c
Stanford Paper Co.	.1082c
Paper Corp. of U. S.	.0915c

No. 9—300,000 lbs., 25x38—70; rolls, 24, 36, and 48 ins. wide, 36 inches in diameter (3-inch fiber cores).

Bermingham & Prosser Co.	.083c
Mead Sales Co., Inc.	.0918c
Mudge Paper Co.	.0965c
Wilcox, Walter Furlong Paper Co.	.08234c
*Walker, Goulard Plehn Co.	.0799c
Barton, Duer & Koch Paper Co.	.0922c
Stanford Paper Co.	.09c
Paper Corp. of U. S.	.0915c

English-Finish Book

No. 10—100,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins. max. width 48 ins.

*Walker, Goulard Plehn Co.	.0874c
Barton, Duer & Koch Paper Co.	.0954c
Paper Corp. of U. S.	.099c

Machine-Finish Book End Paper

No. 17—40,000 lbs., 25x38—160; flat, cut 38x50 ins.

Bermingham & Prosser Co.	.092c
Mead Sales Co., Inc.	.104c
*Walker, Goulard Plehn Co.	.0994c

Offset Book

No. 18—300,000 lbs., 25x38—80; flat, cut any size, min. width 24 ins., max. width 48 ins., the grain to run lengthwise of the sheet.

Whitaker Paper Co.	.1096c
Marquette Paper Corp. (30,000 lbs. only.)	.1047c
Marquette Paper Corp. (270,000 lbs. only.)	.1181c
*Butler Co.	.1043c
Central Ohio Paper Co.	.1195c
Paper Corp. of U. S.	.11c

No. 19—1,300,000 lbs., 25x38—100; flat, cut any size, min. width, 24 ins., max. width 48 ins., the grain to run lengthwise of the sheet.

*Whitaker Paper Co.	.0979c
Central Ohio Paper Co.	.1174c
Walker, Goulard Plehn Co.	.0993c
Barton, Duer & Koch Paper Co. (1,000,000 lbs. only.)	.1048c
Stanford Paper Co.	.1255c
Paper Corp. of U. S. (500,000 lbs. only.)	.1055c

No. 20—300,000 lbs., 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins., the grain to run lengthwise of the sheet.

Bermingham & Prosser Co.	.092c
*Whitaker Paper Co.	.0884c
Central Ohio Paper Co.	.1074c
Stanford Paper Co.	.1105c
John N. McNeil, Inc.	.1168c
Paper Corp. of U. S.	.099c

Antique Book

No. 21—80,000 lbs., 25x38—90; flat, cut 32x42, 33x43, and 38x50 ins.

Mead Sales Co., Inc.	.1054c
Whitaker Paper Co.	.095c
Butler Co.	.0884c
*Walker, Goulard Plehn Co.	.0847c
R. P. Andrews Paper Co.	.0857c
Barton, Duer & Koch Paper Co.	.0979c
Stanford Paper Co.	.1039c
Paper Corp. of U. S.	.1005c

No. 22—100,000 lbs., 25x38—120; flat, cut 32x42, and 38x50 ins.

Mead Sales Co., Inc.	.1054c
Whitaker Paper Co.	.095c
Butler Co.	.0884c
*Walker, Goulard Plehn Co.	.0847c
*R. P. Andrews Paper Co.	.0857c
Barton, Duer & Koch Paper Co.	.0978c
Stanford Paper Co.	.1039c
Paper Corp. of U. S.	.0945c

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TRENT STAINLESS STEEL TUBING

50% Antique Book

No. 26—20,000 lbs., 25x38—80; flat, cut 32x48 and 38 x 48 ins.

Bulkley Dunton, Inc. ..... .1527c
Walker, Goulard Plehn Co. .... .1473c
* Howard Paper Mills Aetna Div. .1468c
Barton, Duer & Koch Paper Co. . .1527c
Paper Corp. of U. S. ..... .1572c

50% Laid Antique Book

No. 29—20,000 lbs., 25x38—140; flat, cut 38x48 ins.; the laid marks to run the 38-inch direction of the sheet; the grain and chain marks to run lengthwise of the sheet.

Cauthorne Paper Co., Inc. .. .... .1399c
Walker, Goulard Plehn Co. ..... .1442c
* Howard Paper Mills, Aetna Div. .1398c
Paper Corp. of U. S. .... .1485c

Water Resistant (Text) Book

No. 30—40,000 lbs., 25x38—120; flat, cut 32x42 and 35x45 ins.

Stanford Paper Co. ..... .1535c
* Paper Corp. of U. S. ..... .1362c

Supercalendered Book

No. 33—200,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins., max. width 48 ins.

Bermingham & Prosser Co. ..... .0949c
Mead Sales Co., Inc. ..... .0966c
Mudge Paper Co. ..... .1025c
* Walker, Goulard Plehn Co. ..... .0941c
R. P. Andrews Paper Co. ..... .0947c

No. 34—300,000 lbs., 25x38—90; rolls, 28½ and 38 ins. wide, 36 ins. in diameter (3-inch fiber cores).

* Mead Sales Co., Inc. ..... .0842c
Mudge Paper Co. (200,000 lbs. only.) ..... .09c
Wilcox, Walter Furlong Paper Co. .08474c
Walker, Goulard Plehn Co. ..... .0854c
R. P. Andrews Paper Co. ..... .0847c

Coated Paper

No. 35—600,000 lbs., 25 x 38—100; flat, cut any size, min. width 24 ins., max. width 48 ins.

John F. Post, Inc. ..... .1275c
* Walker, Goulard Plehn So. ..... .0919c
R. P. Andrews Paper Co. ..... .09849c
Barton, Duer & Koch Paper Co. .0939c
Stanford Paper Co. ..... .0945c
Frank Parsons Paper Co. ..... .0938c

No. 36—175,000 lbs., 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins.

John F. Post, Inc. ..... .1275c
Old Dominion Paper Co. ..... .14328c
* Walker, Goulard Plehn Co. ..... .0919c
R. P. Andrews Paper Co. ..... .09848c
Barton, Duer & Koch Paper Co. .0939c
Stanford Paper Co. ..... .0945c
Frank Parsons Paper Co. ..... .0938c

Coated Book

No. 39—300,000 lbs., 25x38—140; flat, cut 28x41, 32x42, 38x48, 39x50 and 41x52 ins.; the grain to run lengthwise of the sheet.

Consolidated Water Power & Paper Co. .. .. .11319c
Bermingham & Prosser Co. ..... .125c
John F. Post, Inc. ..... .146c
Mead Sales Co., Inc. ..... .127c
* Walker, Goulard Plehn Co. ..... .1127c

Litho Coated Book

No. 42—80,000 lbs., 25x38—140; flat, cut 32x42, 35x45, 38x48, 39x50 and 41x52 ins.; the grain to run lengthwise of the sheet.

Bermingham & Prosser Co. .. .... .1325c
John F. Post, Inc. ..... .146c
Walker, Goulard Plehn Co. ..... .1414c
* Stanford Paper Co. ..... .1279c

Chemical Wood Mimeograph White and Colored

No. 44—1,500,000 lbs., white, No. 40. Flat, cut 28½x34½, 32½x42½, 38x48½ ins. Grain: size 28½x34½ ins., to run the 28½ inch way; size 32½x42½ to run the 42½ inch way; size 38x48½ ins., to run the 38 inch way.

* Bermingham & Prosser Co. ..... .08245c
Whitaker Paper Co. ..... .0845c
Mudge Paper Co. (1,000,000 lbs. only.) ..... .0937c
Cauthorne Paper Co., Inc. ..... .1151c
Walker, Goulard Plehn Co. ..... .0923c
R. P. Andrews Paper Co. (750,000 lbs. only.) ..... .0843c
Barton, Duer & Koch Paper Co. . .0928c
Stanford Paper Co. .. .. .116c
Paper Corp. of U. S. ..... .097c
Pulp & Paper Trading Co. ..... .1208c

No. 45—50,000 lbs., blue, buff, green, pink, and yellow, No. 40. Flat, cut 32½x42½, and 38x48½ ins. Grain: Size 32½x42½ to run the 42½ inch way; size 38x48½ ins. to run the 38 inch way. Min. order, one color, 10,000 lbs.

Bermingham & Prosser Co. ..... .0965c
Cauthorne Paper Co. ..... .1225c
* Walker, Goulard Plehn Co. .. ... .0949c
Stanford Paper Co. ..... .116c

25% Mimeograph

No. 46—600,000 lbs., No. 40; Flat, cut 28½x34½, 32½x42½, 38x48½, and 40½x42½ ins. Grain: Size 28½x34½ ins. to run the 28½ inch way; sizes 32½ x 42½ and 40½x42½ ins. to run the 42½ inch way; size 38x48½ ins. to run the 38 inch way.

Old Dominion Paper Co. ..... .12214c
Cauthorne Paper Co. ..... .1084c
* Walker, Goulard Plehn Co. (300,000 lbs. only) ..... .1051c
Walker, Goulard Plehn Co. (300,000 lbs. only) ..... .1072c
* Howard Paper Mills, Aetna Div. (300,000 lbs. only) ..... .1048c
Howard Paper Mills, Aetna Div (300,000 lbs. only) ..... .1068c
Stanford Paper Co. ..... .1225c

Duplicator Copy Paper, Liquid Progress, White and Colored

No. 47—600,000 lbs., white, No. 40. Flat, cut 32x42, 34x44 and 40x52½ ins.; the grain to run lengthwise of the sheet.

Eastern Corp. (Except size 40 x 52½) ..... .122c
* Bermingham & Prossed Co. ..... .11c
Marquette Paper Corp. ..... .1105c
Cauthorne Paper Co. ..... .1151c
Champion Paper & Fibre Co. ... .1274c
Walker, Goulard Plehn Co. ... .1215c
Stanford Paper Co. ..... .14c
John N. McNail, Inc. ..... .117c
Paper Corp. of U. S. ..... .111c

No. 48—100,000 lbs., pink, yellok, green and blue, No. 40; flat; cut 32x42, 34x44, and 40x52½ ins.; the grain to run lengthwise of the sheet.

Eastern Corp. (Except size 40 x 52½) ..... .129c
Bermingham & Prosser Co. ..... .125c
Marquette Paper Corp. ..... .1163c
* Cauthorne Paper Co., Inc. ..... .1103c
Walker, Goulard Plehn Co. ..... .124c
Stanford Paper Co. ..... .145c

Blue USMO Safety Writing

No. 49—300,000 lbs., No. 32. Rolls, 22 ins. wide, 24 ins. in diameter (3-inch fiber cores).

* Walker, Goulard Plehn Co. (50,000 lbs. only) ..... .1767c
* Walker, Goulard Plehn Co. (50,000 lbs. only) ..... .1769c
* Walker, Goulard Plehn Co. (50,000 lbs. only) ..... .1771c
* R. P. Andrews Paper Co. (100,000 lbs. only) ..... .1787c
R. P. Andrews Paper Co. (100,000 lbs. only) ..... .18c
R. P. Andrews Paper Co. (100,000 lbs. only.) ..... .1808c
* D. L. Ward Co. (150,000 lbs. only) ..... .1797c

Chemical Wood Writing White and Coated

No. 51—150,000 lbs., white, No. 26, flat, cut any size, min. width 21 ins., max. width 48 ins.

Whitaker Paper Co. ..... .1082c
Daley Paper, Inc. ..... .1088c
Walker, Goulard Plehn Co. ..... .1084c
* Barton, Duer & Koch Paper Co. . .1073c
Stanford Paper Co. ..... .131c
Frank Parsons Paper Co. .. .... .1099c

No. 52—3,400,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Whitaker Paper Co. 0924c
Mudge Paper Co. (4600,000 lbs. only) ..... .1074c
Daley Paper, Inc. ..... .0963c
Butler Co. ..... .0989c
Central Ohio Paper Co. (400,000 000 lbs. only) ..... .10c
* Walker, Goulard Plehn Co. ..... .0914c
R. P. Andrews Paper Co. (1,700,000 lbs. only) ..... .0922c
Barton, Duer & Koch Paper Co. .1158c
Stanford Paper Co. ..... .122c
Frank Parsons Paper Co. ..... .1039c

No. 53—2,750,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.

Whitaker Paper Co. ..... .0955c
Daley Paper, Inc. ..... .0964c
Cauthorne Paper Co., Inc. ..... .116c
Walker, Goulard Plehn Co. .. .09605c
* R. P. Andrews Paper Co. ..... .0847c
Barton, Duer & Koch Paper Co. .1098c
Stanford Paper Co. ..... .111c
Frank Parsons Paper Co. ..... .1014c

No. 54—600,000 lbs., white, No. 32. Rolls, min. width 16 ins., max. width 36 ins. in diameter 48 ins. (3-inch fiber cores).

Whitaker Paper Co. ..... .0839c
Daley Papers, Inc. ..... .0923c
Cauthorne Paper Co., Inc. ..... .11c
Butler Co. ..... .0898c
Walker, Goulard Plehn Co. ..... .0862c
* R. P. Andrews Paper Co. ..... .0793c
Barton, Duer & Koch Paper Co. (400,000 lbs. only) ..... .089c
Barton, Duer & Koch Paper Co. (200,000 lbs. only) ..... .1053c
Stanford Paper Co. ..... .107c
Pulp & Paper Trading Co. ..... .1068c

No. 55—300,000 lbs., white, No. 40; rolls, min. width 16 ins., max width 48 ins. 36 ins. in diameter, (3-inch fiber cores).

Daley Papers, Inc. ..... .0896c
Cauthorne Paper Co., Inc. ..... .1019c
Walker, Goulard Plehn Co. ..... .0844c
* R. P. Andrews Paper Co. ..... .0733c
Barton, Duer & Koch Paper Co. .0993c
Stanford Paper Co. ..... .104c
Pulp & Paper Trading Co. ..... .1068c

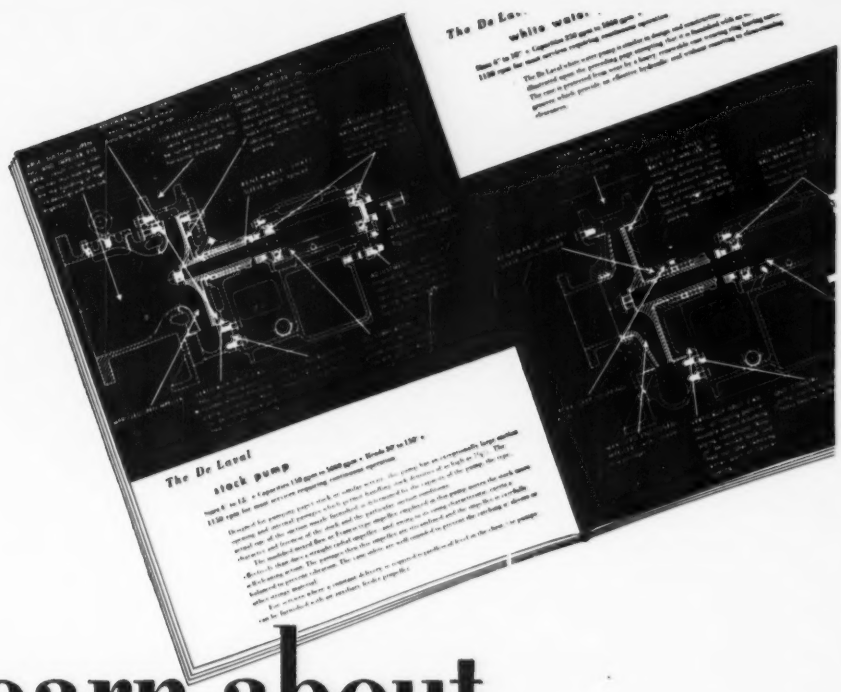
No. 56—30,000 lbs., blue, buff, green, pink, salmon, and yellow, No. 26. Flat, cut any size, min. width 21 ins., max. width 48 ins.

* Walker, Goulard Plehn Co. .... .1125c

No. 57—400,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins. Min. order, one color, 10,000 lbs.

Whitaker Paper Co. ..... .1054c
* Walker, Goulard Plehn Co. ..... .0971c
Stanford Paper Co. ..... .1295c

No. 58—400,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 40; flat, cut any



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size, min. width 21 ins., max. width 48 ins. Min. order, one color, 10,000 lbs.

Whitaker Paper Co. ..... .1021c
Cauthorne Paper Co. ..... .1225c
* Walker, Goulard Plehn Co. ..... .0971c
Barton, Duer & Koch Paper Co. .1063c
Stanford Paper Co. ..... .1235c

Chemical Wood Writing White and Yellow

No. 59—40,000 lbs., white, No. 32. Rolls, 36 ins. wide, 36 ins. in diameter (3-inch fiber cores).

No. 59—40,000 lbs., yellow, No. 32. Rolls, 36 ins. wide, 36 ins. in diameter (3-inch fiber cores).

Walker, Goulard Plehn Co. (White) ..... .1094c
Walker, Goulard Plehn Co. (Yellow) ..... .1174c
Frank Parsons Paper Co. (White) .1089c
Frank Parsons Paper Co. (Yellow) ..... .1139c
* Pulp & Paper Trading Co. ... .1068c
* Pulp & Paper Trading Co. ..... .1106c

Chemical Wood Writing, White and Colored

No. 61—40,000 lbs., white, No. 30, rolls, 23 ins. wide, 34 to 36 ins. in diameter (3-inch fiber cores).

Walker, Goulard Plehn Co. .... .0895c
* Barton, Duer & Koch Paper Co. . .089c
Stanford Paper Co. ..... .1125c
Pulp & Paper Trading Co. ..... .1068c

50% Lithograph-Finish Map

No. 70—20,000 lbs., No. 32. Flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

* Barton, Duer & Koch Paper Co. . .149c
Howard Paper Mills (Aetna Div.) ..... .1539c
Stanford Paper Co. ..... .1538c
John N. McNeil, Inc. ..... .1533c
Paper Corp. of U. S. ..... .1705c

No. 71—20,000 lbs., No. 40, flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

* Barton, Duer & Koch Paper Co. . .149c
Howard Paper Mills (Aetna Div.) .1499c
Stanford Paper Co. ..... .1498c
John N. McNeil, Inc. ..... .1502c
Paper Corp. of U. S. ..... .1592c

No. 73—140,000 lbs., No. 56. Flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

Barton, Duer & Koch Paper Co. .154c
Howard Paper Mills (Aetna Div.) .1469c
Stanford Paper Co. ..... .1468c
Frank Parsons Paper Co. ..... .1762c
* John N. McNeil, Inc. ..... .1444c
Paper Corp. of U. S. ..... .1546c

Chemical Wood Manifold White and Colored

No. 83—100,000 lbs., white, No. 18; flat, cut 21x32, 28x34, 32x42, and 34x44 ins.

Bermingham & Prosser Co. ..... .1299c
Graham Paper Co. ..... .13c
* Old Dominion Paper Co. ..... .12299c
Central Ohio Paper Co. ..... .13c
Walker, Goulard Plehn Co. ..... .1243c
R. P. Andrews Paper Co. ..... .1291c
Stanford Paper Co. ..... .147c
Frank Parsons Paper Co. ..... .1248c
Paper Corp. of U. S. ..... .1299c

No. 84—20,000 lbs., white, No. 18, rolls 22 ins. wide, (3-inch fiber cores).

Bermingham & Prosser Co. ..... .1211c
Graham Paper Co. ..... .115c
Old Dominion Paper Co. ..... .11328c
Central Ohio Paper Co. ..... .115c
Walker, Goulard Plehn Co. ..... .1123c
* R. P. Andrews Paper Co. ..... .1096c
Stanford Paper Co. ..... .1275c
Frank Parsons Paper Co. ..... .1174c
Paper Corp. of U. S. ..... .1274c

No. 85—25,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 18. Flat, cut 28x34, 32x42 and 34x44 ins. Min. order, one color, 5,000 lbs.

Graham Paper Co. ..... .14c
Central Ohio Paper Co. ..... .14c
R. P. Andrews Paper Co. ..... .1419c
* Frank Parsons Paper Co. ..... .1324c
Paper Corp. of U. S. ..... .1349c

No. 87—50,000 lbs., white, No. 18; flat, cut 21x32, 28x34, 32x42, and 34x44 ins.

Graham Paper Co. ..... .2052c
Mudge Paper Co. ..... .1844c
* Old Dominion Paper Co. ..... .17698c
Walker, Goulard Plehn Co. ..... .1789c
R. P. Andrews Paper Co. ..... .2535c
Barton, Duer & Koch Paper Co. .181c
Stanford Paper Co. ..... .1919c
Paper Corp. of U. S. ..... .208c

No. 89—5,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 18. Flat, cut 28x34 and 34x44 ins. Min order, one color, 5,000 lbs.

Mudge Paper Co. ..... .1964c
* Old Dominion Paper Co. ..... .18989c
Walker, Goulard Plehn Co. ..... .2587c
R. P. Andrews Paper Co. ..... .2535c
Barton, Duer & Koch Paper Co. ... .2125c
Paper Corp. of U. S. ..... .225c

No. 90—10,000 lbs., No. 18, Flat, cut 32x42 ins. Min. order 10,000 lbs.

* Graham Paper Co. ..... .2587c
Mudge Paper Co. ..... .317c
Walker, Goulard Plehn Co. ..... .4092c
R. P. Andrews Paper Co. ..... .385c
Barton, Duer & Koch Paper Co. .329c
Stanford Paper Co. ..... .333c
Paper Corp. of U. S. ..... .269c

50% White Glazed Manifold

No. 91—20,000 lbs., No. 16. Flat, cut 32x42 ins. Min. order, 20,000 lbs.

Graham Paper Co. ..... .2152c
Old Dominion Paper Co. ..... .19979c
Butler Co. ..... .2094c
Walker, Goulard Plehn Co. ..... .2963c
R. P. Andrews Paper Co. ..... .2875c
* Barton, Duer & Koch Paper Co. . .2015c
Paper Corp. of U. S. ..... .2235c

Chemical Wood Bond White

No. 102—40,000 lbs., white, No. 40, flat, cut any size, min. width 21 ins., max. width 38 ins.

Eastern Corp. ..... .122c
Whitaker Paper Co. ..... .1134c
Wilcox, Walter Furlong Paper Co. .112c
* Walker, Goulard Plehn Co. ..... .1059c

25% Bond, White and Colored

No. 105—80,000 lbs., white, No. 26. Flat, cut any size, min. width 21 ins., max. width 48 ins.

Wilcox, Walter Furlong Paper Co. .1509c
Barton, Duer & Koch Paper Co. .151c
Howard Paper Mills, Aetna Div... .1486c
Stanford Paper Co. ..... .159c
Frank Parsons Paper Co. ..... .182c
John N. McNeil, Inc. ..... .1561c

No. 106—700,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., bax. width 48 ins.

Bermingham & Prosser Co. (100,000 lbs. only) ..... .1333c
Bermingham & Prosser Co. (100,000 lbs. only) ..... .1349c
Bermingham & Prosser Co. (100,000 lbs. only) ..... .1367c
Mudge Paper Co. (100,000 lbs. only) ..... .1333c
Butler Co. (100,000 lbs. only) .1333c
Butler Co. (100,000 lbs. only) .1349c
Butler Co. (100,000 lbs. only) .1367c
R. P. Andrews Paper Co. ..... .1339c
Howard Paper Mills, Aetna Div. (350,000 lbs. only) ..... .1298c
* Howard Paper Mills, Aetna Div. (350,000 lbs. only) ..... .1321c
Frank Parsons Paper Co. ..... .1576c

No. 109—1,200,000 lbs., No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.

Bermingham & Prosser Co. (100,000 lbs. only) ..... .1302c
Bermingham & Prosser Co. (100,000 lbs. only) ..... .1312c
Whitaker Paper Co. (300,000 lbs. only) ..... .1288c
Mudge Paper Co. (100,000 lbs. only) ..... .1302c
Mudge Paper Co. (100,000 lbs. only) ..... .1312c
Old Dominion Paper Co. (300,000 lbs. only) ..... .12878c
Butler Co. (100,000 lbs. only .... .1302c
Butler Co. (100,000 lbs. only) .. .1312c
Butler Co. (100,000 lbs. only) ... .1332c
Walker, Goulard Plehn Co. (200,000 lbs. only) ..... .1294c
* Howard Paper Mills, Aetna Div. (400,000 lbs. only) ..... .1244c
* Howard Paper Mills, Aetna Div. (400,000 lbs. only) ..... .1254c
* Howard Paper Mills, Aetna Div. (400,000 lbs. only) ..... .1274c
Frank Parsons Paper Co. ..... .1526c
Stanford Paper Co. (100,000 lbs. only) ..... .1302c
Stanford Paper Co. (100,000 lbs. only) ..... .1312c

No. 115—180,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 32. Flat, cut any size, min. width 21 ins., max. width 48 ins.

Bermingham & Posser Co. ..... .1373c
* Howard Paper Mills, Aetna Div. .1347c
Frank Parsons Paper Co. ..... .1626c

No. 114—50,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 40. Flat, cut any size, min. width 21 ins., max. width 48 ins.

Barton, Duer & Koch Paper Co. .133c
* Howard Paper Mills, Aetna Div. .1294c
Frank Parsons Paper Co. ..... .1576c
John N. McNeil, Inc. ..... .1341c

No. 118—40,000 lbs., white, No. 32. Flat, cut 32x42 and 38x48 ins.

No. 118—20,000 lbs., buff, No. 32. Flat, cut 29x41 ins.

* Barton, Duer & Koch Paper Co. (White) ..... .154c
* Barton, Duer & Koch Paper Co. (Buff) ..... .159c
Howard Paper Mills, Aetna Div. (White) ..... .1573c
Frank Parsons Paper Co. ..... .1656c
John N. McNeil, Inc. (White) .. .1573c
John N. McNeil, Inc. (Buff) .. .1619c

No. 122—10,000 lbs., No. 40. Flat, cut any size, min. width 21 ins., max. width 34 ins.

Walker, Goulard Plehn Co. ..... .1549c
R. P. Andrews Paper Co. ..... .1589c
Barton, Duer & Koch Paper Co. .164c
Howard Paper Mills, Aetna Div. .1649c
* Stanford Paper Co. ..... .1532c
Frank Parsons Paper Co. ..... .1584c

100% White Bond

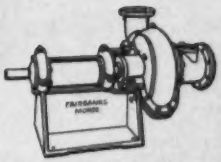
No. 130—15,000 lbs., No. 40, flat, cut any size, min. width 16 ins., max. width 38 ins. Min. order, 2,000 lbs.

Walker, Goulard Plehn Co. ..... .2439c
R. P. Andrews Paper Co. ..... .2674c
* Barton, Duer & Koch Paper Co. . .239c
Stanford Paper Co. ..... .2489c
Frank Parsons Paper Co. ..... .2568c

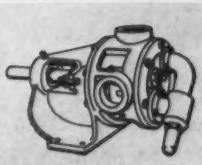
Chemical Wood White Ledger

No. 150—150,000 lbs., No. 48. Flat, cut any size, min. width 17 ins., max. width 48 ins.

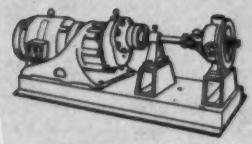
Wilcox, Walter Furlong Paper Co. .116c
Walker, Goulard Plehn Co. ..... .1215c
Stanford Paper Co. ..... .1107c
Eastern Corp. ..... .115c
* Whitaker Paper Co. ..... .1104c
Cauthorne Paper Co. ..... .1249c
Pulp & Paper Trading Co. ..... .1133c



Paper Stock Pumps



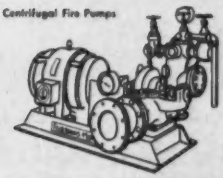
Frame Constructed Rotary Pumps

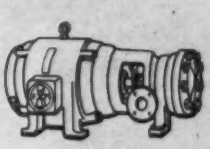


Rotary Pumps with Geared Hood Motor Drive

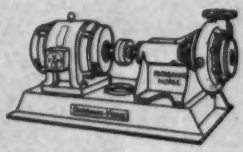
Vertical Propeller Pumps

Centrifugal Fire Pumps

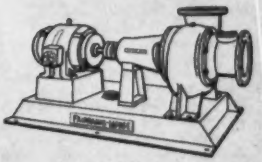




Two-Stage Bulltogether Pumps



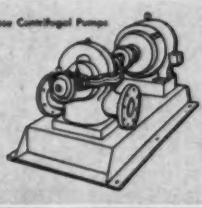
Horizontal Sewage and Trash Pumps

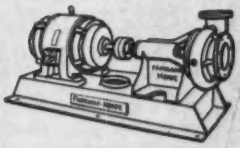


Horizontal Angle Flow Pumps

Vertical Close-Coupled Sewage and Trash Pumps

Split-Case Centrifugal Pumps

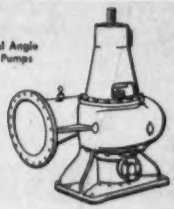


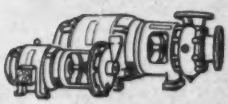


Base-Mounted Centrifugal Pumps

Vertical Sewage and Trash Pumps

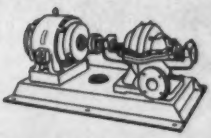
Vertical Angle Flow Pumps



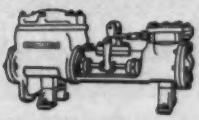


Bulltogether Centrifugal Pumps

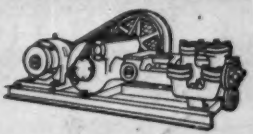
Deep Well Turbine Pumps



Two-Stage Centrifugal Pumps



Duplex Steam Pumps



8 Cover Slot -Pot Duplex Power Pumps

for Pumps...

THAT DELIVER

plus performance
lasting dependability
unsurpassed economy

The Fairbanks-Morse Pump Dealer is your best bet for assistance in pump selection...for reliable service. Fairbanks, Morse & Co., Chicago 5, Ill.

FAIRBANKS-MORSE

A name worth remembering

DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS • SCALES
MOTORS • GENERATORS • STOKERS • RAILROAD MOTOR CARS
and STANDPIPES • FARM EQUIPMENT • MAGNETOS

No. 151—20,000 lbs., No. 64, flat, cut any size, min. width 17 ins., max. width 48 ins.

Wilcox, Walter Furlong Paper Co.	.116c
Walker, Goulard Plehn Co.	.118c
Stanford Paper Co.	.1117c
* Whitaker Paper Co.	.1104c
Pulp-Paper Trading Co.	.1133c

No. 153—40,000 lbs., No. 88. Flat, cut any size, min. width 17 ins., max. width 48 ins.

Eastern Corp	.115c
Wilcox, Walter Furlong Paper Co.	.116c
Walker, Goulard Plehn Co.	.114c
Stanford Paper Co.	.1137c
* Pulp & Paper Trading Co.	.1133c

25% Ledger, White and Colored

No. 154—175,000 lbs., white, No. 48; flat, cut 28x34, 32x42, 34x44, and 38x48 ins. Min. order 10,000 lbs.

Baxter Paper Co.	.159c
Mudge Paper Co.	.1362c
Walker, Goulard Plehn Co.	.1754c
* Howard Paper Mills, Aetna Div.	.1304c
Stanford Paper Co.	.1246c

No. 155—100,000 lbs., white, No. 64, flat, cut 28x34, 32x42, 34x44, and 38x48 ins. Min. order 10,000 lbs.

Baxter Paper Co.	.1573c
Bermingham & Prosser Co.	.1359c
Walker, Goulard Plehn Co.	.1354c
* Howard Paper Mills, Aetna Div.	.1304c
Stanford Paper Co.	.1336c

No. 157—30,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 64. Flat, cut 34x44 ins. Min. order, one color, 10,000 lbs.

Baxter Paper Co.	.1593c
Bermingham & Prosser Co.	.1419c
Barton, Duer & Koch Paper Co.	.1398c
* Howard Paper Mills, Aetna Div.	.1354c
Stanford Paper Co.	.1286c

No. 176—4,000 lbs., No. 48. Flat, cut 28x34, 32x42 and 34x44 ins. Min. order, 4,000 lbs.

Mudge Paper Co.	.2799c
* Walker, Goulard Plehn Co.	.2439c
R. P. Andrews Paper Co.	.271c
Barton, Duer & Koch Paper Co.	.249c

No. 178—10,000 lbs., No. 88. Flat, cut 22x31 and 34x44 ins. Min. order, 10,000 lbs.

* Walker, Goulard Plehn Co.	.2479c
R. P. Andrews Paper Co.	.2699c
Barton, Duer & Koch Paper Co.	.244c
Stanford Paper Co.	.274c

Chemical Wood, White and Colored Index

No. 182—200,000 lbs., white, 25½x30½—220; flat, cut 22x42 and 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.

Whitaker Paper Co.	.1022c
Old Dominion Paper Co.	.10568c
Butler Co.	.1047c
Wilcox, Walter Furlong Paper Co.	.1019c
Walker, Goulard Plehn Co.	.1042c
R. P. Andrews Paper Co.	.1025c
* Frank Parsons Paper Co.	.1014c
Pulp & Paper Trading Co.	.1018c

No. 183—20,000 lbs., white, 25½x30½—280; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.

Whitaker Paper Co.	.1047c
Old Dominion Paper Co.	.10568c
Butler Co.	.1047c
Wilcox, Walter Furlong Paper Co.	.1074c
Walker, Goulard Plehn Co.	.1097c
R. P. Andrews Paper Co.	.1025c
* Pulp & Paper Trading Co.	.1018c

No. 184—10,000 lbs., single-ply, 25½x30½—280; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.

Whitaker Paper Co.	.1075c
Walker, Goulard Plehn Co.	.1097c
R. P. Andrews Paper Co.	.1025c
* Pulp & Paper Trading Co.	.1018c

No. 185—40,000 lbs., buff, single-ply; 25½x30½—220; flat, cut 32x42 ins., with projecting colored-paper marker between each 100 sheets.

Whitaker Paper Co.	.1125c
Wilcox, Walter Furlong Paper Co.	.1149c
Walker, Goulard Plehn Co.	.1079c
* R. P. Andrews Paper Co.	.0964c
Pulp & Paper Trading Co.	.1098c

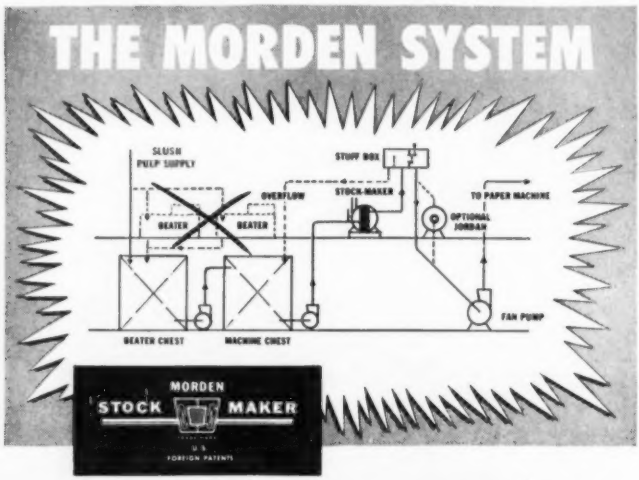
50% Index, White and Colored

No. 188—400,000 lbs., white, 25½x30½—220; flat, cut 32x42 and 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.

Bulkley Dunton, Inc.	.165c
Mudge Paper Co.	.1558c
Butler Co. (100,000 lbs. only)	.13987c
Butler Co. (100,000 lbs. only)	.142786c
Butler Co. (200,000 lbs. only)	.143792c
Walker, Goulard Plehn Co.	.1394c
R. P. Andrews Paper Co.	.175c
* Barton, Duer & Koch Paper Co. (200,000 lbs. only)	.1342c
* Barton, Duer & Koch Paper Co. (200,000 lbs. cu'y)	.1362c
Howard Paper Mills, Aetna Div.	.1374c

No. 191—120,000 lbs., blue, buff, cherry, fawn, green, pink, salmon, and yellow; 25½x30½—220; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, 10,000 lbs.

Mudge Paper Co.	.159c
Butler Co.	.143999c



SIMPLE • DIRECT • EFFICIENT

THE MORDEN "STOCK-MAKER" readily fits into all types of stock treatment systems.

The above diagram shows how simply it can be located in the line between the machine chest and stuff box.

"Stock-Maker's" balanced beating and refining treatment makes possible the elimination of batch treatment in beaters or the cutting tendency in jordans. One Morden can replace the treatment of two or more conventional beaters.

"Stock-Maker's" continuous, controlled treatment direct-to-the-paper-machine gives improved quality, increased production and substantial savings in space, power, labor and maintenance. Or "Stock-Makers" can be used in combination with your present equipment for additional treatment to give increased production and improved quality.

Ask Morden to outline the "Stock-Maker" system best suited to your particular requirements.

MORDEN MACHINES COMPANY
PACIFIC BUILDING • PORTLAND 4, OREGON

in Canada
The William Kennedy & Sons, Ltd. Owen Sound, Ontario

in England
Millspaugh, Limited, Sheffield

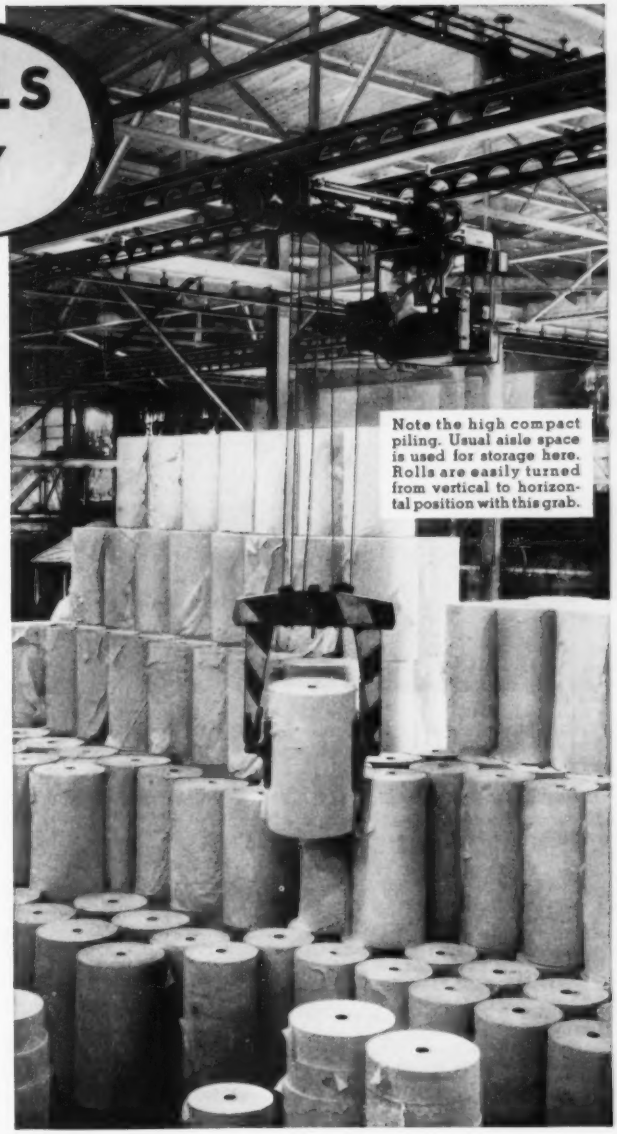
600 ROLLS PER DAY

Handled by Roll Grab System

A Cleveland Tramrail roll-handling system, which has been in continuous operation since 1940, handles rolls of napkin and toilet paper from paper machine to storage at B-F-D Division of Diamond Match Company, Plattsburg, New York.

Most of the rolls are 30" dia. by 4'6"; some are as big as 36" dia. by 81". They are stored tightly together and piled up to 5 high (or 22'6" height). The same crane and grab that places rolls in storage also takes them out and delivers them to converting department. Nearly all rolls are, therefore, handled twice and the Tramrail System actually handles around 600 rolls in a 24-hour period.

Far more rolls are stored here because of the Tramrail System than would otherwise be possible. They are picked up and delivered in faster time. Costs are cut. Danger of injury is minimized.



Note the high compact piling. Usual aisle space is used for storage here. Rolls are easily turned from vertical to horizontal position with this grab.

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THE CLEVELAND CRANE & ENGINEERING CO.
7115 EAST 287th STREET • WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Walker, Goulard Plehn Co. ..... .1434c
R. P. Andrews Paper Co. ..... .175c
* Barton, Duer & Koch Paper Co. . .1398c
Howard Paper Mills, Aetna Div. .1414c

No. 192—20,000 lbs., blue, buff, cherry, fawn, green, pink, salmon, and yellow; 25½x30½—280; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one colore, 10,000 lbs.

Mudge Paper Co. ..... .1612c
Walker, Goulard Plehn Co. ..... .1447c
* Barton, Duer & Koch Paper Co. . .1398c
Howard Paper Mills, Aetna Div. .1464c

100% White Index

No. 196—40,000 lbs., 25½x30½—250; flat, cut 20¼x30 ins.

Walker, Goulard Plehn Co. ..... .2409c
R. P. Andrews Paper Co. ..... .2649c
* Barton, Duer & Koch Paper Co. . .2385c

Coated Cover White and Colored

No. 200—50,000 lbs., white, 20x26—120; flat, cut 26½x41 and 34x44 ins.; the grain to run lengthwise of the sheet. Min. order, 10,000 lbs.

Bermingham & Prosser Co. ..... .127c
* Walker, Goulard Plehn Co. ..... .1187c

Antique-Finish Cover, White and Colored

No. 202—40,000 lbs., white, 20x26—100. Flat, cut 25¼x39 inches.

Wilcox, Walter Furlong Paper Co. .113c
R. P. Andrews Paper Co. ..... .13c
Stanford Paper Co. ..... .13c
Whitaker Paper Co. ..... .112c
* Pulp & Paper Trading Co. ..... .1108c

No. 203—100,000 lbs., 20x26—100; blue, buff, dawn, quaker, drab, terra cotta, gray, brown, green, gobelin blue, granite, tea, and yellow; flat, cut 25¼x39 inches. Min. order, one color, 10,000 lbs.

* Marquette Paper Corp. ..... .1125c
R. P. Andrews Paper Co. ..... .1225c
Stanford Paper Co. ..... .1375c
Pulp & Paper Trading Co. ..... .1344c

Cloth Lined Cover, White and Colored

No. 205—7,000 lbs., white, brown, and quaker drab; facing paper, 20x26—72; flat, cut 36x38 ins.

Barton, Duer & Koch Paper Co. (White, per M sheets) $264.85
Barton, Duer & Koch Paper Co. (Colored, per M sheets) ..... $298.
* Stanford Paper Co. (White, per M sheets) $264.85
* Stanford Paper Co. (Colored, per M sheets) $297.80
Whitaker Paper Co. (White, per M sheets) $264.85
Whitaker Paper Co. (Colors, per M sheets) ..... $298.
Mudge Paper Co. (White, per M sheets) $264.85
Mudge Paper Co. (Colors, per M sheets) $298.00

50% Laid Cover, Colored

No. 206—60,000 lbs., blue, cream, white, gray, and green; 20x26—130; flat, cut 25¼x39 and 28x41 inches. Min. order, on color, 2,000 lbs.

Wilcox, Walter Furlong Paper Co. .181c
R. P. Andrews Paper Co. ..... .1809c
* Paper Corp. of U. S. ..... .1754c
Mudge Paper Co. ..... .18c

No. 208—80,000 lbs., 24x36—80; flat, cut 25x38, and 32x42 ins.

Wood Manila

No. 210—80,000 lbs., 24x36—80; rolls, 21 ins. wide, 34 to 36 ins. in diameter. (3-inch fiber cores).

Mead Sales Co., Inc. ..... .1875c
Whitaker Paper Co. ..... .0775c
* Walker, Goulard Plehn Co. ..... .0701c
Stanford Paper Co. ..... .0789c
Frank Parsons Paper Co. ..... .0755c
Mead Sales Co., Inc. ..... .08c
Whitaker Paper Co. ..... .07c
Cauthorne Paper Co., Inc. ..... .09c
* Walker, Goulard Plehn Co. ..... .0669c
Barton, Duer & Koch Paper Co. . .0714c
Stanford Paper Co. ..... .0714c
Frank Parsons Paper Co. ..... .0695c

Rope Manila

No. 216—5,000 lbs., 24x36—280; rolls, 48 ins. wide. (3-inch fiber cores). Min. order, 5,000 lbs.

R. P. Andrews Paper Co. ..... .339c
* Paper Corp. of U. S. ..... .3065c

No. 2 Kraft

No. 218—15,000 lbs., 24x36—100; flat, cut any size, in wrapped bundles.

No. 218—20,000 lbs., 24x36—140; flat, cut any size, in wrapped bundles.

* Trinity Bag & Paper Co., Inc. (Sub. 100) ..... .0635c
* Trinity Bag & Paper Co., Inc. (Sub. 140) ..... .0635c
Arlington Sales Agency, Inc. (Sub. 100) ..... .0675c
Arlington Sales Agency, Inc. (Sub. 140) ..... .0675c
Whitaker Paper Co. (Sub. 100) .0675c
Whitaker Paper Co. (Sub. 140) .0675c
Old Dominion Paper Co. (Sub. 100) ..... .06897c
Old Dominion Paper Co. (Sub. 140) ..... .06898c
Cauthorne Paper Co., Inc. (Sub. 100) ..... .06648c
Cauthorne Paper Co., Inc. (Sub. 140) ..... .06648c
R. P. Andrews Paper Co. ..... .0675c
R. P. Andrews Paper Co. ..... .0675c

No. 219—5,000 lbs., 24x36—100; cut any size, folded (25 sheets per fold), in wrapped bundles.

* R. P. Andrews Paper Co. ..... .0675c
Arlington Sales Agency, Inc. ..... .07c
Whitaker Paper Co. ..... .0675c
Cauthorne Paper Co., Inc. ..... .07648c

No. 220—20,000 lbs., 24x36—100; rolls, min. width 9 ins., max. width 48 ins., wound on wooden plugs, 1½-inch hole, or on 3-inch fiber cores as may be specified.

* Trinity Bag & Paper Co., Inc. ..... .0385c
Arlington Sales Agency, Inc. ..... .0625c
Whitaker Paper Co. ..... .0625c
Old Dominion Paper Co. ..... .06417c
Cauthorne Paper Co., Inc. ..... .06148c
R. P. Andrews Paper Co. ..... .0625c

White Gummed

No. 252—150,000 sheets, (ungummed), No. 36; flt, cut 22x34 ins. Min. order, 25,000 sheets.

R. P. Andrews Paper Co. (per M sheets) $22.09
Stanford Paper Co. (per M sheets) $22.20
Paper Corp of U. S. (per M sheets) $22.38
Bulkley Dunton, Inc. (per M sheets) $22.29
Whitaker Paper Co. (per M sheets) $21.285
* Mudge Paper Co. (per M sheets) $21.24
Old Dominion Paper Co. per M sheets) $21.838
Butler Co. (per M sheets) $21.932

25% Blotting, White

No. 254—10,000 lbs., 19x24—160; flat, cut 19x 24 ins., in wrapped bundles. Min. order 10,000 lbs.

Whitaker Paper Co. ..... .145c
Marquette Paper Corp. ..... .14c
* Old Dominion Paper Co. ..... .13409c
Butler Co. ..... .1498c
Central Ohio Paper Co. ..... .1525c
Walker, Goulard Plehn Co. ..... .1344c
R. P. Andrews Paper Co. ..... .1523c
Stanford Paper Co. ..... .15c

High-Finish Chemical Wood Manila Tag

No. 271—80,000 lbs., 24x36—280; flat, cut 28x 34 and 38x48 ins.

Walker, Goulard Plehn Co. ..... .0971c
R. P. Andrews Paper Co. ..... .0948c
Paper Corp. of U. S. ..... .0975c
* Whitaker Paper Co. ..... .0918c
Old Dominion Paper Co. ..... .09438c
Pulp & Paper Trading Co. ..... .0954c

Jute Tag

No. 280—40,000 lbs., 22½x28½—200; flat, cut 34x44 ins., min. order, 10,000 lbs.

Walker, Goulard Plehn Co. ..... .1629c
* R. P. Andrews Paper Co. ..... .1564c
Paper Corp. of U. S. ..... .174c

Railroad Board, White and Colored

No. 302—20,000 lbs., white, flat, 22x34; 8-ply, each 100 sheets fully banded. Min. order, 5,000 sheets.

* Paper Corp. of U. S. (per M sheets) $75.25
Old Dominion Paper Co. (per M sheets) $74.698

No. 304—20,000 lbs., ash gray, green, orange, and red. Flat, 22x34; 4-ply, each 100 sheets fully banded. Min. order, one color, 5,000 sheets.

Old Dominion Paper Co. (per M sheets) $64.648
No awards.

No. 305—10,000 lbs., buff, .at, 22x28 ins., 14-ply, each 50 sheets fully banded. Min. order, 5,000 sheets.

Old Dominion Paper Co. (per M sheets $96.997
No awards.

Wood Cardboard, Colored

No. 306—150,000 lbs., buff; 22½x28½—150; rolls, 20 ins. wide (3-inch fiber cores).

Bermingham & Prosser Co. ..... .076c
* Bulkley Dunton, Inc. ..... .069c
Walker, Goulard Plehn Co. ..... .0723c
Barton, Duer & Koch Paper Co. .0749c
Frank Parsons Paper Co., Inc. . .0772c
Paper Corp. of U. S. ..... .0799c
Pulp & Paper Trading Co. ..... .0884c

No. 308—10,000 lbs., melon, 22½x28½—184; flat, cut 20x30 ins., in wrapped bundles with projecting colored-paper marker between each 100 sheets.

Walker, Goulard Plehn Co. ..... .0889c
* Paper Corp. of U. S. ..... .0848c
Bermingham & Prosser Co. ..... .076c
Pulp & Paper Trading Co. ..... .0899c

No. 309—100,000 lbs., blue, buff, green, melon, pink, and yellow; 22½x28½—184. Rolls, 20 ins. wide (3-inch fiber cores).

Bermingham & Prosser Co. ..... .076c
Walker, Goulard Plehn Co. ..... .0747c
Barton, Duer & Koch Paper Co. .0749c
Paper Corp. of U. S. ..... .0759c
* Pulp & Paper Trading Co. ..... .074c

Chemical Wood Tan Board

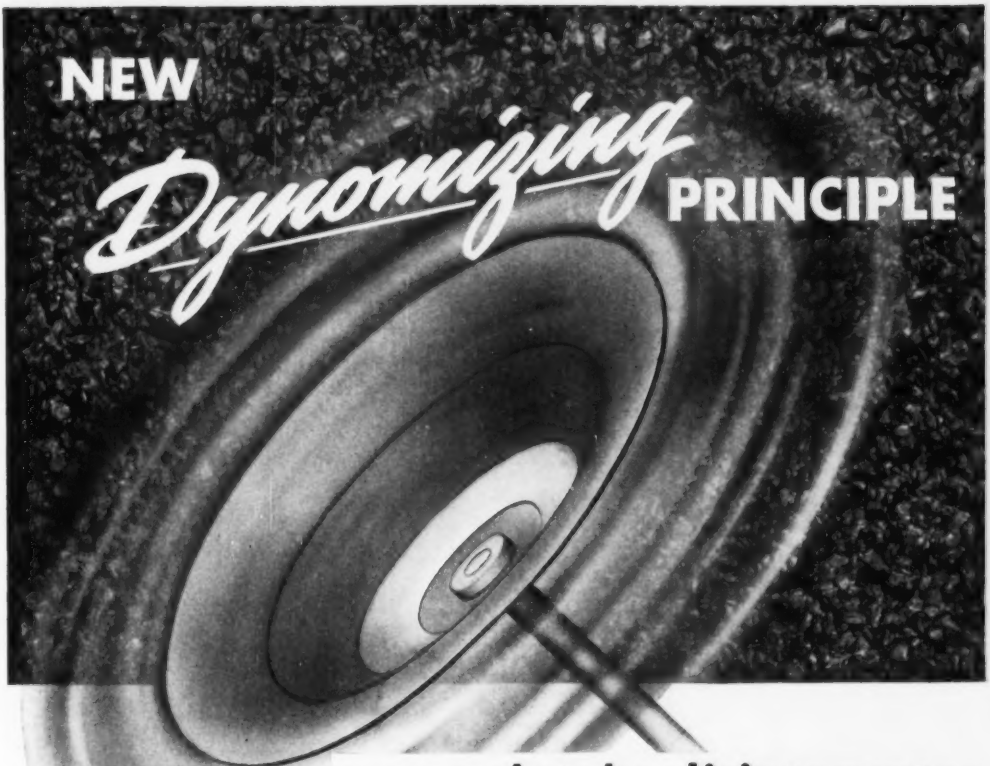
No. 310—50,000 lbs., 22½x28½—200; flat, cut 25x38, 28x38, and 34x44 inches.

Walker, Goulard Plehn Co. ..... .1172c
* R. P. Andrews Paper Co. ..... .116c
Paper Corp. of U. S. ..... .1285c
Whitaker Paper Co. ..... .12c
Old Dominion Paper Co. ..... .11674c

United States Postal Card Paper

No. 325—6,000,000 lbs., 22½x28½—188; rolls, 33ins. wide, 36 ins., in diameter (6-inch iron or metal capped returnable fiber cores).

* Walker, Goulard Plehn Co. (1,300,000 lbs. only) ..... .0828c
* R. P. Andrews Paper Co. (2,400,000 lbs. only) ..... .0816c
* Frank Parsons Paper Co. (1,000,-



—completely disintegrates any type of paper stock

The pulp or waste paper to be processed is hydraulically drawn into the center of the concave surface of the DynoPeller. The periphery of the DynoPeller is lined with numerous rough pieces of hardened tungsten carbide. Centrifugal force forces the stock over this roughened surface where the dynomizing action takes place in the treatment of the stock.

The stock is completely disintegrated—being reduced to its original fibre length—each individual fibre being completely separated from its neighbor.

Send for additional information.

The DynoPulper

is equipped with two DynoPellers and is primarily used in a batch operation. A bale may be charged at one time. This machine is also available in laboratory size.

The QuatroPulper

is also primarily used in batch operations. It is equipped with four DynoPellers and will handle large volumes.

The DynoChest

is equipped with one DynoPeller and will process broke or slush stock. It is used as a storage chest while completing the defiberization of stock.

The DynoFiner

is equipped with either four or six small DynoPellers. It is used in a continuous operation and completely separates fibre bundles from slush stock.

RICE BARTON
Research Corporation
WORCESTER 1, MASS.

000 lbs. only) ..... .0784c
* Whitaker Paper Co. (2,000,000 only) ..... .0818c
Whitaker Paper Co. (2,000,000 lbs. only) ..... .0831c
Whitaker Paper Co. (2,000,000 lbs. only) ..... .0837c

No. 327—150,000 lbs., 22½x28½—188; rolls, 22 ins. wide, 36 ins. diameter (6-inch iron or metal capped returnable fiber cores).
* Whitaker Paper Co. ..... .0818c

Pressboard, Colored

No. 351—20,000 lbs., red, flat, cut 30x36 ins., thickness .0140 inch. Min. order, 5,000 sheets.
* R. P. Andrews Paper Co. (per C sheets) $13.23
Barton, Duer & Koch Paper Co. (per C sheets) $14.95

No. 352—20,000 lbs., gray, flat, cut 30x36 ins., thickness .0300 inch. Min. order, 5,000 sheets.
R. P. Andrews Paper Co. (per C sheets $34.06
* Barton, Duer & Koch Paper Co. (per C sheets) $25.58
Bird & Sons, Inc. (per C sheets) $28.80
Whitaker Paper Co. (per C sheets) $31.91
Whitaker Paper Co. (per C sheets —20,000 sheets order) $29.53

Newsboard

No. 360—200,000 lbs., 26x38; No. 100; flat, cut any size, min. 21x32 ins., max. 40x52½ ins. (To be guillotine-trimmed square on four sides).
Mead Board Sales, Inc. ..... .036c
Whitaker Paper Co. ..... .03325c
Mudge Paper Co. ..... .03219c
Resolute Paper Products Corp. .. .03246c
Old Dominion Paper Co. ..... .032628c
Walker, Goulard Plehn Co. ..... .03087c
* R. P. Andrews Paper Co. ..... .0297c
Stanford Paper Co. ..... .034c
Paper Corp. of U. S. ..... .0327c
Pulp & Paper Trading Co. ..... .03341c

Binders Board, No. 1 Quality

No. 366—50,000 lbs., No. 1. 25¼x30¼ ins., Nos. 16, 18, 20, 25, 30, and 40; flat, cut to trim 25x30 ins.
R. P. Andrews Paper Co. ..... .05237c
R. P. Andrews Paper Co. ..... .05582c
Barton, Duer & Koch Paper Co. .055c
* Whitaker Paper Co. ..... .05372c

No. 367—10,000 lbs., No. 1 quality, 25¼x30¼; Nos. 12 and 20, flat; to trim 34x44 ins.
R. P. Andrews Paper Co. ..... .05537c
* R. P. Andrews Paper Co. ..... .05782c

Chestnut Cover Board

No. 369—20,000 lbs., 25¼x30¼; flat, to trim 25x30 inches, Nos. 17, 19, 21, 25, 31, and 41.
* Mead Board Sales, Inc. (No. 40) .057c
* Mead Board Sales, Inc. (All other numbers) ..... .05325c

No. 370—20,000 lbs., 25¼x30¼ Nos. 16, 19, 24, and 31. Flat, to trim 25¼x37¼ ins.
* Mead Board Sales, Inc. ..... .05325c

GPO Printing and Binding Needs Second Half of 1949

WASHINGTON—Sealed proposals will be received at the U.S. Government Printing Office, Office of the Public Printer, until ten o'clock, a. m. May 16, and immediately thereafter opened, for furnishing paper boxes, cartons and containers, including knocked down paper boxes for packing letter paper, for the use of the GPO. The materials are specified in "Proposal for Material for the Public Printing and Binding for the Term of Six Months, Beginning July 1, 1949," as follows:

Knocked-Down Paper Boxes For Packing Letter Paper

No. 210—1,500 lbs. Paper Boxes, 10¼ by 8¾ by 2½ inches, inside dimensions sample required to show construction of box).....per M
No bid

Postal-Card Carton Boxes

No. 211—2,500,000 lbs., Cartons, "C", 5⅞ by 5¼ by 3¼ inches, inside dimensions, openings to be on the 5⅞ by 5¼-inch sides; to be securely wrapped and tied in packages of 300 cartons each (sample required to show construction of carton). Sample will be furnished to bidder upon request, to show style of cut desired on notched top and bottom flaps. ..... per M
* Rogers Printing Co. (per M) $6.33
Cardox Box Co. (per M) 7.35
Consolidated Paper Co. (per M) .. 7.29
Slater Paper Box Co. (per M) ... 8.92
Climax Manufacturing Co. (per M) 7.50
National Paper Box Manufacturing Co. (per M) 7.85
Cauthorne Paper Co. (per M) 7.239
Old Dominion Paper Co. (per M) 6.88
Bartges Box Co. (per M) 6.45

No. 212—300,000 lbs., Cartons, "B", 6⅝ by 5⅞ by 2⅜ inches, inside dimensions, openings to be on the 6⅝ by 5⅞-inch sides; to be securely wrapped and tied in packages of 300 cartons each (sample required to show construction of carton). Sample will be furnished to bidder upon request, to show style of cut desired on notched top and bottom flaps.....per M
* Rogers Printing Co. (per M) $7.22
Cardox Box Co. (per M) 8.20
Consolidated Paper Co. (per M) .. 9.26
Slater Paper Box Co. (per M) 9.89
Climax Manufacturing Co. (per M) 8.15
National Paper Box Manufacturing Co. (per M) 12.75
Cauthorne Paper Co. (per M) 8.648
Old Dominion Paper Co. (per M) 7.448
Bartges Box Co. (per M) 8.11

Corrugated Fiber Postal-Card Shipping Containers, Card Containers

No. 213—2,500 lbs., Containers, No. , 27½ by 11¾ by 6¾ inches, inside dimensions, openings to be on the 27½ by 11¾-inch sides; to be tied in unwrapped packages of 25 containers each.
United Container Co. $111.25
Vernco Specialties Co. 102.55
Container Corporation of America . 104.80
Union Bag & Paper Corp. 113.60
D. A. Horn Co. 122.00
Eastern Box Co. 119.50
Standard Corrugated Case Corp. .. 104.95
J & J Corrugated Box Corp. 115.50
* Crescent Box Corp. 102.50

No. 214—125,000 lbs., Containers No. 2, 17⅛ by 11¾ by 10⅝ inches, inside dimensions, openings to be on the 17⅛ by 11¾-inch sides; to be tied in unwrapped packages of 25 containers each. ..... per M
United Container Co. $90.00
* Industrial Container Corp. by Vernco Specialties 85.90
Container Corp. of America 91.40
Union Bag & Paper Corp. 97.60
D. A. Horn Co. 105.00
Eastern Box Co. 104.00
Standard Corrugated Case Corp. .. 90.30
J & J Corrugated Box Corp. .. . 91.65
Crescent Box Corp. 89.75
Kieckhefer Container Corp. 88.95

No. 215—15,000 lbs., Containers, No. 3, 17⅛ by 11⅜ by 5¼ inches, inside dimensions, openings to be on the 17⅛ by 11⅜-inch sides; to be tied in unwrapped packages of 25 containers each. ..... per M
United Container Co. $71.75
Vernco Specialties Co. 68.15
Container Corporation of America 69.95
Union Bag & Paper Corp. 75.70
D. A. Horn Co. 81.50
Eastern Box Co. 79.00
Standard Corrugated Case Corp. . 70.70
J & J Corrugated Box Corp. 76.60
* Crescent Box Corp. 67.75

No. 216—1,500 lbs., Containers, No. 5, 13¼ by 11¼ by 5⅝ inches, inside dimensions, openings to be on the 13¼ by 11¼-inch sides; to be tied in unwrapped packages of 25 containers each. ..... per M
United Container Co. $76.15
* Industrial Container Corp. by Vernco Specialties 60.15
Container Corp. of America 65.90
Union Bag & Paper Corp. 65.60
D. A. Horn Co. 72.25
Eastern Box Co. 75.00
Standard Corrugated Case Corp. .. 61.55
J & J Corrugated Case Corp. 71.70
Crescent Box Corp. 65.75

No. 217—15,000 lbs., Containers, No. 7, 11 by 5¾ by 6¾ inches, inside dimensions, openings to be on the 11 by 5¾-inch sides; to be tied in unwrapped packages of 25 containers each... .. .. per M
United Container Co. $39.10
* Industrial Container Corp. by Vernco Specialties 31.80
Container Corp. of America 36.50
Union Bag & Paper Corp. 33.60
D. A. Horn Co. 38.75
Eastern Box Co. 39.00
Standard Corrugated Case Corp. .. 38.25
J & J Corrugated Case Corp. 37.80
Crescent Box Corp. 35.50

No. 218—1,000 lbs., Containers, No. 8, 11⅛ by 6¾ by 5⅝ inches, inside dimensions, openings to be on the 11⅛ by 6¾-inch sides; to be tied in unwrapped packages of 25 containers each.....
United Container Co. $50.95
* Industrial Container Corp. by Vernco Specialties 37.00
Container Corp. of America 43.10
Union Bag & Paper Corp. 39.10
D. A. Horn Co. 41.50
Eastern Box Co. 48.50
Standard Corrugated Case Corp. .. 42.25
J & J Corrugated Box Corp. 45.10
Crescent Box Corp. 44.25

No. 219—15,000 lbs., Containers, No. 11, 14 by 13½ by 11¼ inches, inside dimensions, openings to be on the 14 by 13½-inch sides; to be tied in unwrapped packages of 25 containers each. ..... per M
United Container Co. $101.40
* Industrial Container Corp. by Vernco Specialties 93.85
Container Corp. of America 97.85
Union Bag & Paper Corp. 97.60
D. A. Horn Co. 114.00
Eastern Box Co. 112.00
Standard Corrugated Case Corp. .. 98.55
J & J Corrugated Box Corp. 107.07
Crescent Box Corp. 96.75

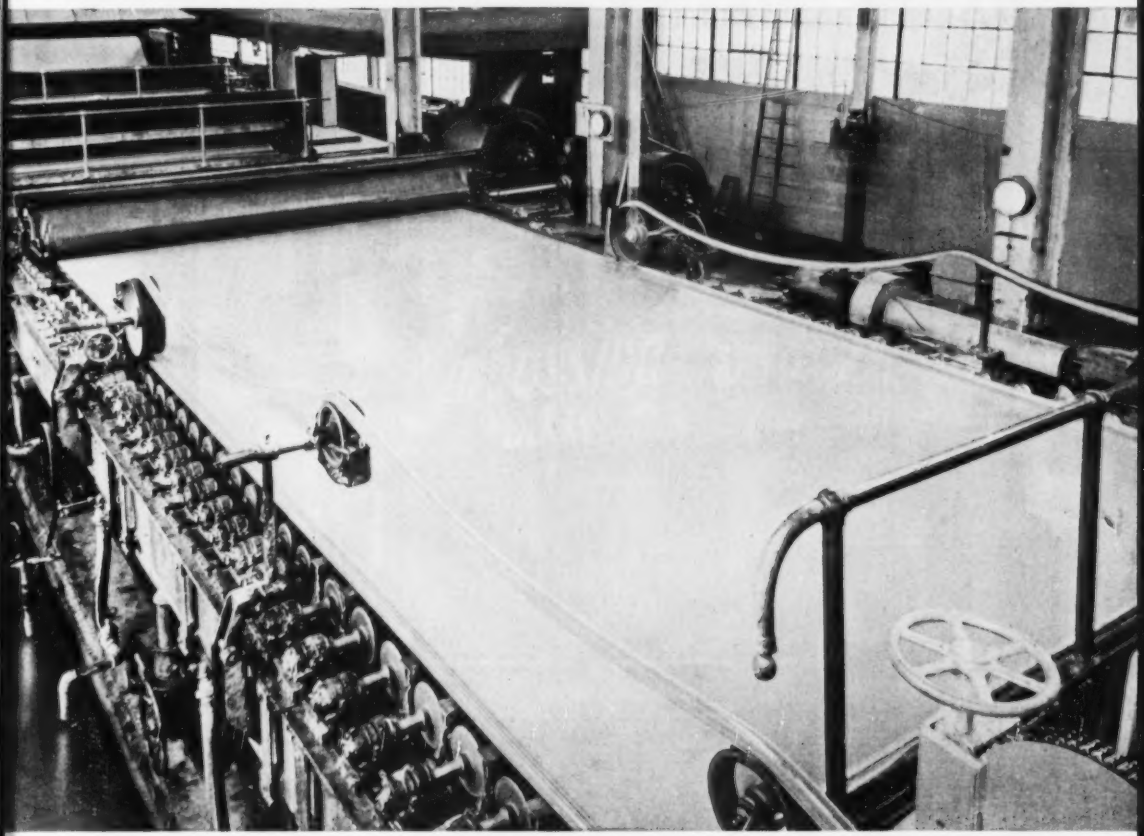
Sheet Postal-Card Shipping Containers

No. 220—50,000 lbs., Containers No. 12, inside dimensions 32¾ by 22⅛ by 5¾ inches with due allowance for the thickness of the inside pads; to be tied in packages of 25 containers each. Two pads must be supplied for each container, to be tied in packages of 25 each... .....per M
* Industrial Container Corp. by Vernco Specialties $273.50
Eastern Box Co. 314.00

Metal Ink Containers; Slip Top

No. 221—1,000 lbs., Containers for 5 lbs. Offset Ink.—6⅛ inches diameter by 4¼ inches height, inside dimensions. Capacity: Not less than 127.5

THE BAGLEY & SEWALL SIMPLEX FOURDRINIER . . .



. . . QUICK WIRE CHANGING TYPE

Pictured is a 171 inch Quick Wire Changing Type Fourdrinier installed at the Taggart Corporation Mill.

Mills using this Fourdrinier find it is simple to operate and reduces shut-down time to a minimum.

This type of Fourdrinier can be installed as part of new machines or be put on existing machines where speed in changing Fourdrinier wires is of utmost importance.

Our engineers will be glad to consult with you regarding your production problems. Write us.

BAGLEY & SEWALL

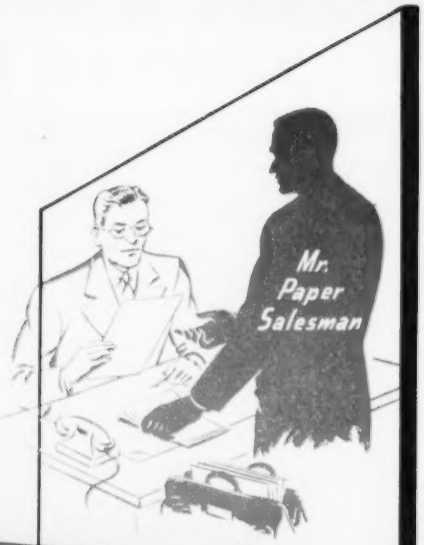
DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY

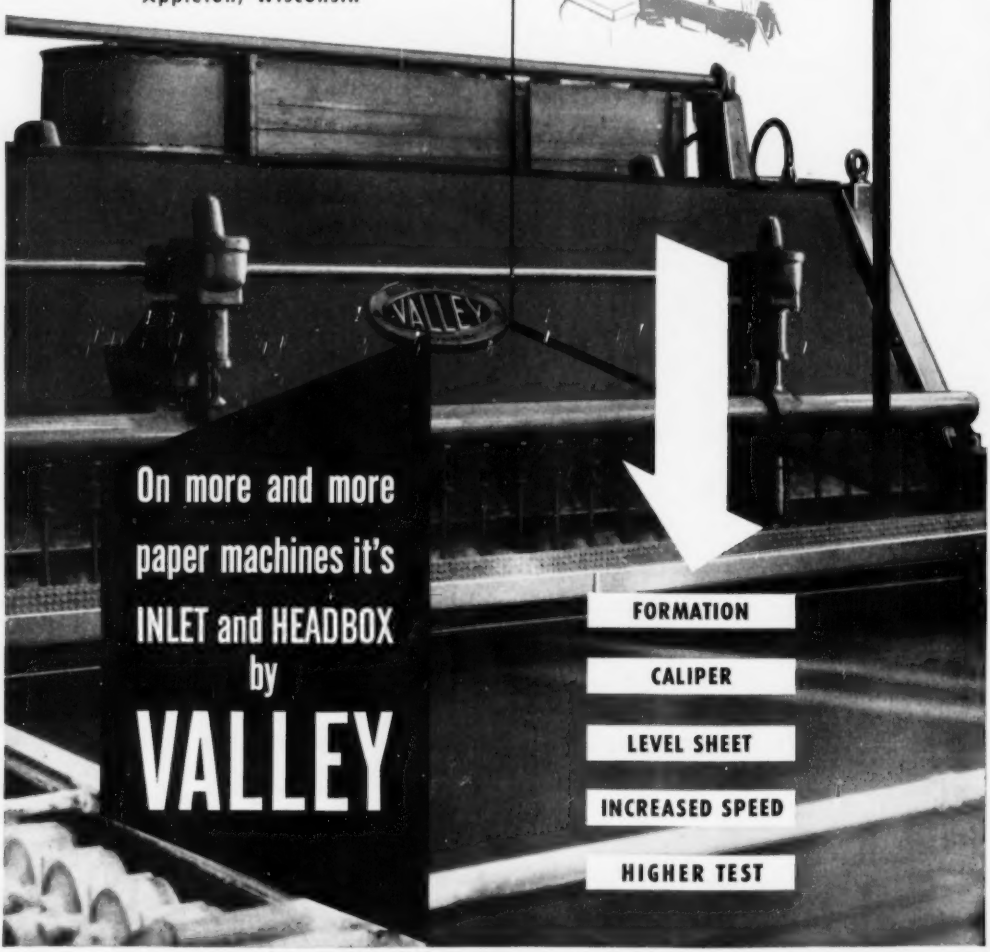
WATERTOWN, NEW YORK

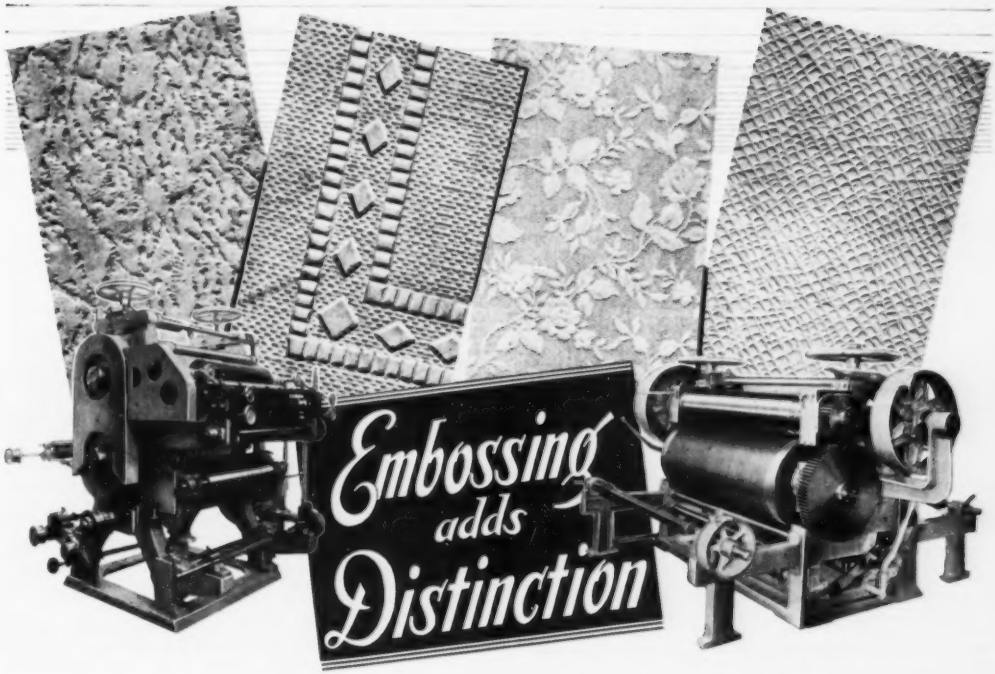
PAPER QUALITY *and* INLETS *are tied together*

Much of what your salesmen can truthfully say about the quality of your paper is connected directly with the performance of your inlets. One of the best breaks you can give your salesmen is to have the *best* stock entrance equipment... INLET and Headbox by VALLEY. An inquiry will start the ball a-rolling.

VALLEY IRON WORKS COMPANY
Appleton, Wisconsin







for your material and design . . there's a

WALDRON Embossing Machine

Embossed patterns illustrated above are only typical of the great variety available to you. Machines illustrated are (left) High Speed Heavy Duty Type, and (right) Centennial Heavy Duty Type for extra wide goods.

Write for Catalog 110—giving full information on machines and methods.

Whether your material is paper, plastic, or foil; whether the embossed effect is of the regular, ink or two-toned type — a **WALDRON** Sheet or Roll Embosser can give your goods or product a new, vivid sales appeal to greatly widened markets. Designed to meet every requirement for good embossing—precision built frames, rolls, bearings — there are **WALDRON** Machines to handle goods up to 64" in width at speeds up to 700 ft. per minute. Investigate the possibilities of **WALDRON** Embossing to lift your product above competition.

Coating Machines
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Floor Cov. Machines
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Laminating Machines
Printing Machines
Rubber Mill Machines
Wall Paper Machines
Waxing Machines
Winders and Slitters
Special Design Machines

JOHN WALDRON CORP.

Main Office & Works

NEW BRUNSWICK, NEW JERSEY

BUILDERS OF QUALITY MACHINES SINCE 1827

cubic inches. Standard deep slip covers. Can edge to be rolled. All seams soldered..... .. per M

Feins Tin Can Co.	$135.00
* Feins Tin Can Co.	145.00

No. 222—1,000 lbs., Containers for 5 lbs. ink.—7¼ inches diameter by 4 inches height, inside dimensions. Capacity: Not less than 165.4 cubic inches. Can edges to be rolled. All seams soldered.....per M

Feins Tin Can Co.	$158.00
* Feins Tin Can Co.	168.00

No. 223—1,000 lbs., Containers for 10 lbs. ink.—7⅛ inches diameter by 6 inches height, inside dimensions. Capacity: Not less than 256 cubic inches. Can and cover edges to be rolled. All seams soldered. .....per M

Feins Tin Can Co.	$165.00
* Feins Tin Can Co.	175.00

Glass Containers

No. 226—150 gross, 2-13/64 Flint Glass, Round Ink Bottles
Capacity: 2-13/64 ounces.
Diameter: 2 inches.
Body Height: 1½ inches.
Over-all height: 2¼ inches.
Finish: 30½ C.T. smooth.
Color: White.
Closure: Screw cap 33 MM. Metal or plastic lined with waxed or enamel faced liner.
Bottles and caps to be shipped unassembled.....
.....per gross

No Bid

Corrugated Containers

No. 227—100,000 lbs., Containers, 16½ inches by 11 inches by 9¾ inches inside dimensions, openings to be in the 16½ inches by 11 inches sides; to be tied in unwrapped bundles of 25 containers each.....per M

United Container Co.	$78.20
Vernco Specialties Co.	76.30
* Container Corp. of America	72.67
Union Bag & Paper Corp.	83.20
D. A. Horn Co.	95.00
Eastern Box Co.	90.00
Standard Corrugated Case Corp. ..	79.00
J & J Corrugated Box Corp.	80.25
Crescent Box Corp.	82.25
Kieckhefer Container Corp.	75.45

No. 228—100,000 lbs., Containers, 18½ inches by 12½ inches by 7 inches, inside dimensions, openings to be on the 18½ inches by 12½ inches sides; to be tied in unwrapped bundles of 25 containers each.....per M

United Container Co.	$85.40
Vernco Specialties Co.	80.95
* Container Corp. of America	76.05
D. A. Horn Co.	99.90
Eastern Box Co.	94.00
Standard Corrugated Case Corp. ..	82.85
J & J Corrugated Box Corp.	83.85
Crescent Box Corp.	84.25
Kieckhefer Container Corp.	78.85

Solid Fiber Containers

No. 229—150,000 lbs., Containers, 16½ inches by 11 inches by 9¾ inches inside dimensions, openings to be on the 16½ inches by 11 inches sides; to be tied in unwrapped bundles of 25 containers each..... per M

United Container Co.	$121.25
* Container Corp. of America	149.30
D. A. Horn Co.	147.50
Eastern Box Co.	140.00
Kieckhefer Container Corp.	148.85

No. 230—100,000 lbs., Containers, 18½ inches by 12½ inches by 7 inches, inside dimensions, openings to be on the 18½ inches by 12½ inches sides; to be tied in unwrapped bundles of 25 containers each.. .....per M

* United Container Co.	$129.00

Miscellaneous

No. 237—50,000 lbs., corrugated Mailing Board, 38 by 38 inches, double-faced, kraft or chip. Bursting strength average not less than 60 points; thickness of corrugating medium average .009 inch; normal thickness 3/16 inch, tied in bundles of 25 sheets each (sample required) .....per sheet

* United Container Co.	$64.30
Vernco Specialties Co.	81.25
Eastern Box Co.	92.00

Army Awards Made

N. Y. QM Purchasing Office

QM-30-280-49-1286 — Folders, File, Manila, Vertical Flat Type, Plain Bottom, Heavy Weight, 100 per box, ½ cut, 9½ x 11⅜", and ⅓ cut, 9½ x 14¾", to:

Warshaw Mfg. Co., Inc., N.Y.C.—975,000 ea. (9½ x 11⅜") from: $.008 to $.0083.

James F. Walsh Paper Co., N.Y.C.—675,000 ea. (9½ x 14¾") from: $9.16 to $10.60 M.

Ennis Tag & Salesbook Co., Ennis, Texas—375,000 ea. (9½ x 14¾") from: $.01015 to $.01145.

Crownola Looseleaf Products, N.Y.C.—1,525,000 ea. (9½ x 11⅜") from: $.00749 to $.00975.

Directive quantity was: 3,000,000 each. Procurement for U. S. Army.

QM-30-280-49-1206—Tape, Blank Recording, to:

Orchard Paper Co., St. Louis, Mo.—780,000 ea. from: $.0946 to $.1048.

Directive quantity was 555,000 each. This procurement is for the U. S. Army Signal Corps.

Two (2) awards have been made on:

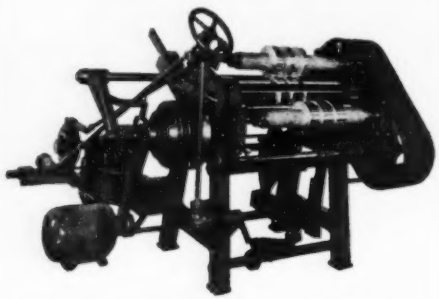
QM-30-280-49-1275 covering Wrapping, Greaseproof, 36" wide, to:

Mid-Wax Paper Co., Fort Madison, Iowa—1,312 rolls @ $18.42.

Newark Paraffine & Parchment Paper Co., Newark, N. J.—1,687 rolls @ $19.16.

Directive quantity was 2,400 rolls. This procurement is for the U. S. Army.

GOOD DELIVERY — MODERATE PRICED
PRECISION BUILT
SLIT-MASTER



Duplex Slitters & Re-winders
IN 4 SIZES
24"—36"—42"—52" WEB WIDTH
Designed for Slitting Cellophane—Foil and Acetate Stock

WRITE FOR COMPLETE DETAILS

SUBURBAN MACHINE COMPANY
Designers & Builders
Special Paper Converting Machinery
CINCINNATI — 11 — OHIO

THE PULP & PAPER TRADING CO.
New York

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WOOD PULP

Chemical — Mechanical

Bleached and Unbleached

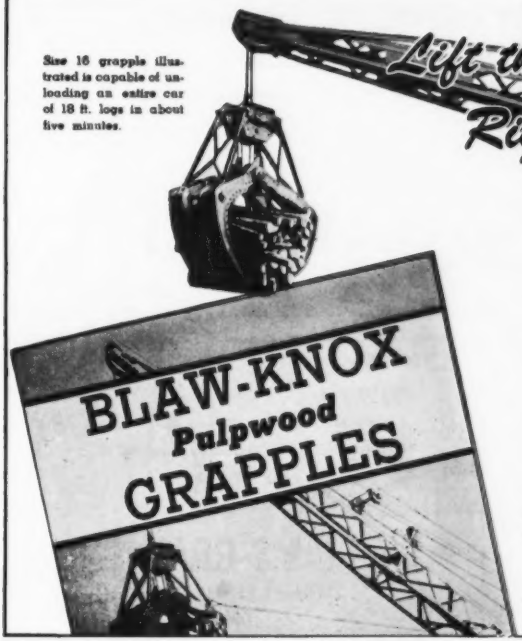
Also Paper and Board

European Representative

JACOB VERSTEEGH

Stockholm Sweden

Size 16 grapple illustrated is capable of unloading an entire car of 18 ft. logs in about five minutes.



Lift the One You Need Right Out of Bulletin #2043

Wherever pulp wood is handled you'll find Blaw-Knox grapples doing a fast, economical job — loading, unloading and stacking . . . From the photos, drawings and specifications contained in Bulletin No. 2043 you can select the one best suited to your needs. Write for it today.

Send for your copy of Bulletin No. 2055.

BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
2055 Farmers Bank Bldg., Pittsburgh 22, Pa.
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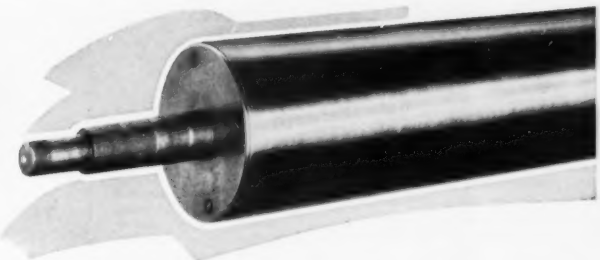
The Right Answer to Your "Roll Call"!

WELDCO



● America's leading pulp and paper mills use Weldco Monel-covered table rolls, for these steel rolls have high strength and stiffness . . . and twice as much sag-resistance as other types of rolls. Monel-covered rolls are carefully ground for accuracy and uniformity, are polished to a fine, smooth surface that reduces friction and keeps fibre and paper from sticking.

Shown here is a 6" diameter x 157" face table roll, covered with a 1/16" Monel sheet, with Monel end covers. One mill has had rolls of this type in service for 7 years, and reports no sagging or whipping, no corrosion or tendency to accumulate pitch. In addition, the rolls require very little cleaning, have high abrasion-resistance, show little wear on fourdrinier wires, and withstand acids and alkaline white waters.

If your plant processes paper, pulp, or chemicals, you, too, may find Weldco Monel-covered rolls the right answer to your "roll call." Write or phone us today for complete information and descriptive literature.

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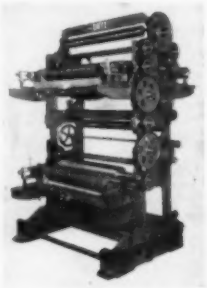

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Photo, Courtesy J. M. Huber Corporation

Single Instrument Measures Smoothness, Porosity and Softness of Paper

You just interchange the lower test plates in the GURLEY-HILL S-P-S Tester to convert it into an instrument for testing either smoothness, porosity or softness of any type of paper, by measuring a given air-leakage over or through the paper.

This 3 in 1 laboratory "assistant" is simple to operate, quick and accurate, and a real utility instrument where printing quality of paper must be reliably measured.

Bulletin No. 1400 describes the S-P-S Tester as well as other Gurley paper testing instruments. It's worth writing for today. W. & L. E. Gurley, 520 Fulton St., Troy, New York.

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YES! GO WEST! 1949 Fall Meeting TAPPI Portland, Oregon.

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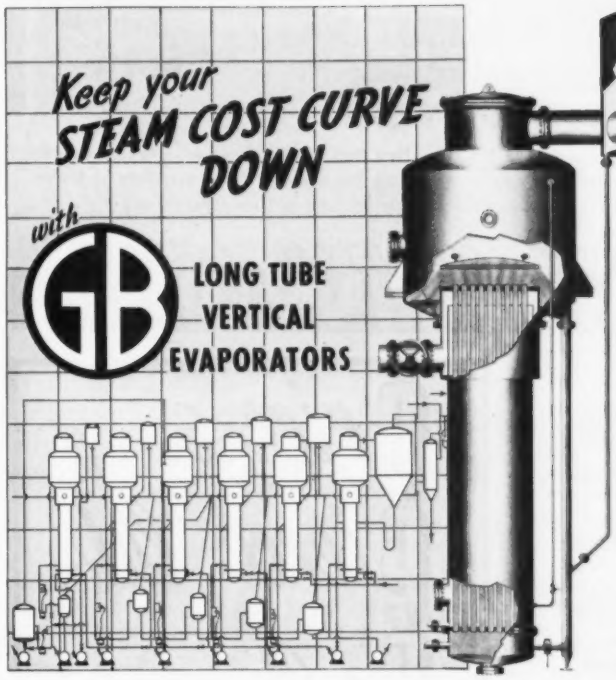

If your black liquor evaporators are obsolete, your steam costs are probably abnormally high, even for these days. Only by increasing the number of effects with an efficient condensate flash removal system can you decrease evaporation costs to offset increased steam costs.

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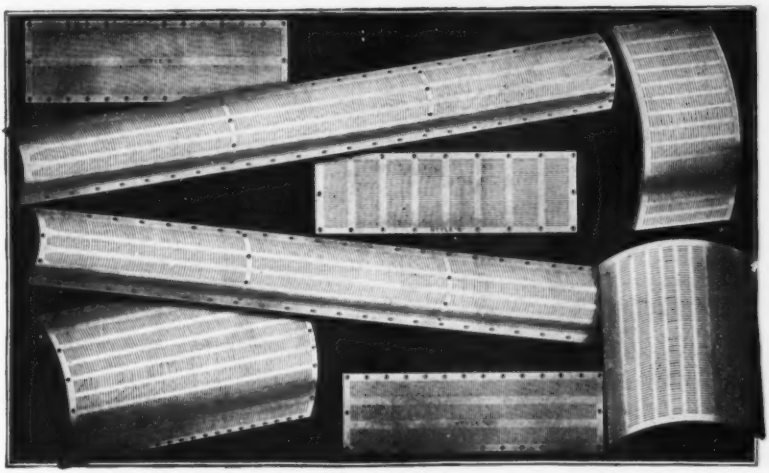

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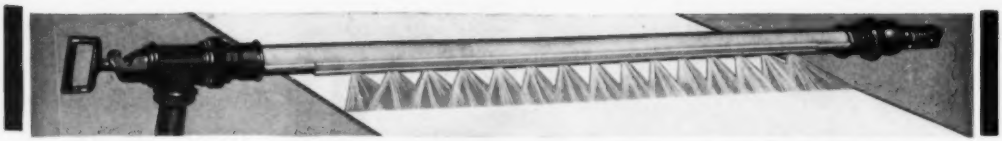
MAGNUS METAL CORP. FITCHBURG, MASS.

YES! GO WEST! 1949 FALL MEETING TAPPI, PORTLAND, OREGON.



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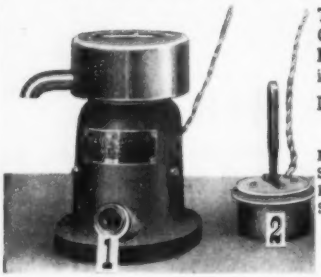

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1500	*Westg.	MT	253
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1000	*Westg.	CW	300
800	*Westg.	CW	367
750	*Westg.	CW	900
750	*G.E.	MT-16	450
600	G.E.	IM	350
600	*G.E.	IM	600
600	*G.E.	IM	900
500	*Ideal	AV	1800
500	*Tl.Ch.	ANY	514
400	*G.E.	MT-412	440
400	*Al.Ch.	ANY	514
400	Westg.	CW	900
400	*G.E.	IM	900
400	*Al.Ch.	ANY	1200
350	*G.E.	IP	720
300	*Westg.	CW	367
300	G.E.	IM	450
300	G.E.	MT-410	450
300	*G.E.	IM	600
300	*Al.Ch.	ANY	720
300	Westg.	CW	900
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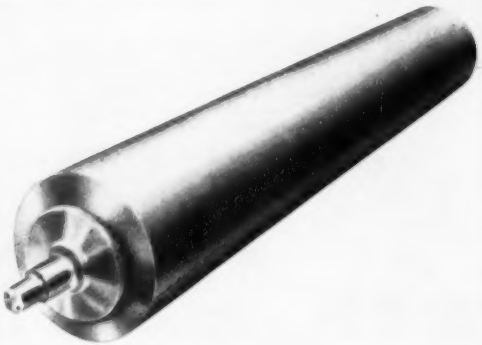

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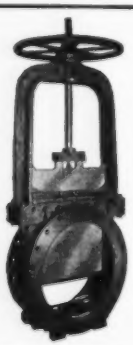

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METALS — I.B.B.M., all iron, bronze or stainless steels, body parts plain or rubber lined.

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More and more paper makers are becoming aware of the outstanding advantages of the Mount Hope Free Wheeling Expander.

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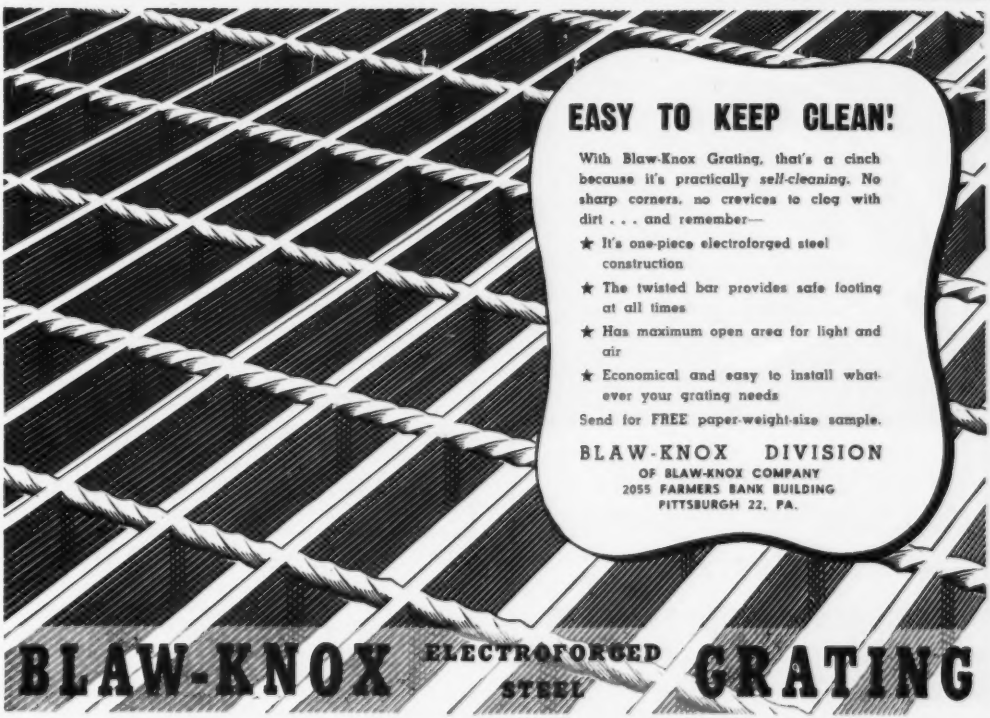

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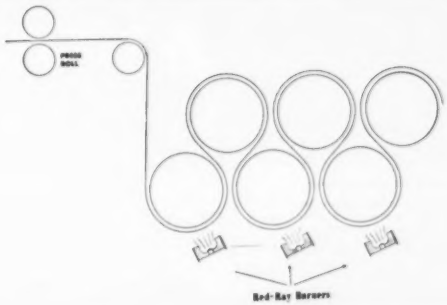

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automatic controls, installed at wet end of machine increase drying capacity. Turned off automatically if paper breaks or machine stops.

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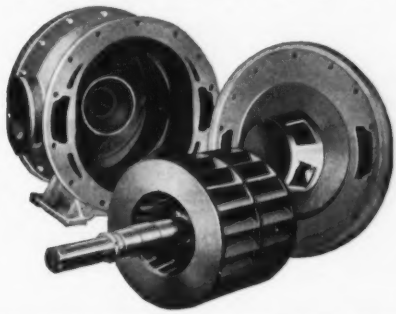

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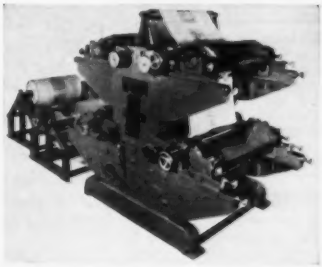

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(Automatic Hydraulic Aniline Printing Press)

Investigate the many new technical innovations and improvements:

1. Hydraulic, instant on and off impression control.
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4. One single impression drive gear (no back lash).
5. Most rigid solid and compact 5 inch frame construction.
6. A complete **one** push-button controlled press.

Check and compare these, and many other new features with any other Aniline Press on the market and then give your plant, and press operators the finest press to work with.

★ **Widths from 31" to 122"**
★ **From two to twelve colors**

Excellent for the speedy, highgrade production in printing all kinds of paper, board, and indispensable for cellophane, polyethylene saran and any other plastic films and foils.

Duplex Slitters and Rewinders, with and without cooling rolls in widths up to 86 inches wide.

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for all equipment exposed to corrosion by sulphite acids or other corrosive agents

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Two General Superintendents for mills in the West; mechanical, power and electrical engineers and assistants; millwrights.

Chemists and laboratory men; salesman to sell stationery to department stores and stationers in southern New England area; beater engineers; machine tenders; back tenders.

We invite correspondence (confidential) with mills seeking executives and with executives seeking new positions.

CHARLES P. RAYMOND SERVICE, Inc.
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To head up sales for Wisconsin Mill making Waxing, Special Wrapping, Toweling, Tissue and converting papers.

Must be experienced and acquainted with trade in Middle West.

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Modern progressive midwest kraft mill requires superintendent thoroughly familiar with specialty papers. Give resume and salary expected. Good opportunity for right man. Address Box 49-303 care Paper Trade Journal. J-7

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Slitters & Rewinders; Die Cutters; Printers; Scorers & Creasers; Gluers & Wrappers; Coaters; Laminators; Waxers; Stitchers.

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2929 S. Wabash Ave., Chicago 16, Ill.
TF

GOOD VALUES—NEW & USED

34" Beck Sheeter, one year old.
58" and 78" Hamblet Sheeters.
34" Camachine No. 6 Slitter.
32" Hobbs and 34" Inman shear cut Slitters —very cheap.
39" Chandler & Price Automatic Power Paper Cutter.
New 44" National Auto. Power Cutters and 36" National Hydraulics.
Baling Presses—both hand and power.
Brackett 3-knife Trimmer.
28 x 41 Thomson Cutter & Creaser.

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York 18
(Plant at Stamford, Conn.)
TF

FOR SALE OR LEASE

Small Paper Mill-Cylinder Machine. Situated advantageously to sources of raw material and sales outlet. Terms. Address Box 49-297 care Paper Trade Journal. J-23

SPECIALTY BAG PLANT FOR SALE: Equipped to wax and print, as well as make bags. Other interests, as well as remote location of owners, prompts offer at low price. Will consider continuing in business if new interests will operate plant. Address Box 49-301 Paper Trade Journal. J-23

FOR SALE

Paper baler made by Ohio Cultivator Company, making bales of approximately 350#, price $350.00.

Also hand baler making bale size approximately 40x20x40, price $150.00.

Address Box 49-307 care Paper Trade Journal. J-7

RATES FOR CLASSIFIED ADVERTISING

HELP WANTED—10c a word. Double rate for heavy face type. Minimum charge $2.50.

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FOR SALE—10c a word. Double rate for heavy face type. Minimum charge $2.50.

WANTED—10c a word. Double rate for heavy face type. Minimum charge $2.50.

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TELEPHONE
HUMBOLDT 2-2177

CABLE ADDRESS: JACKROSS

ROSS PAPER MACHINERY CO.

265 PASSAIC STREET
NEWARK 4, N. J.

CONVERTING
PAPER MAKING EQUIPMENT

NEW, USED, REBUILT
PAPER AND PULP MACHINERY

1—Pusey & Jones 120" Ball Bearing Fourdrinier Paper Machine. 60" diameter dryers—suction press and suction couch—Spiral Bevel Gear Drives.
1—Pusey & Jones 82" Fourdrinier Machine Complete.
1—7 cylinder 120" Board Machine, 82 Dryers, 42" diameter. Complete with all auxiliaries.
1—6 cylinder 132" Board Machine, 67 Dryers, 42" diameter. Complete with all auxiliaries.

HEATERS

2—Valley Iron 750 lb. Iron Tub—Bronze filled.
1—Downingtown 2000 lb. Beater Roll—66" x 80" —with perforated bank fall. Iron tub.
1—E.D. Jones 2000 lb. Beater Roll—67" x 90". Iron tub and bottom.

BLOWERS

8—Blowers and Mill Exhausters.

CALENDER ROLLS

54 Chilled Iron Rolls—Assorted sizes.

CALENDER STACKS

1—104" face 5 roll stack, with drive
1—76" face 7 roll with drive.
1—76" face 3 roll with drive.
1—112" face 7 roll.
1—82" face 5 roll Sandy Hill.

CONVEYOR

1—18½ ft long x 30" wide—with motor.

COUCH ROLLS—BRASS

1—104" face x 19" dia.
1—118" face x 18" dia.
1—150" face x 18" dia.
1—92" face x 19½" diameter.
3—94" face x 21¾" diameter.

COUCH ROLLS—RUBBER

1—118" face x 29" dia.—New
1—130" face x 19" dia.

CYLINDER MOLDS

1—IMPCO 40" diameter x 84" face.
3—36" diameter x 130" face Cylinder molds with vats, couches—ball bearing.
2—74" face x 38" diameter.
1—134" face x 38" diameter, with stainless steel shafts.
1—70" face x 38" diameter.

CYLINDERS AND VATS

1—136" face x 36" dia.—with vats, couch, complete.

DRIVES

1—8C. Reeves Drive. 40-50 h.p.—Ratio 4 to 1.

DRYERS

4—74" face x 28" diameter with gears.
1—143" face x 48" diameter.
1—124" face x 48" diameter.
1—80" face x 36" diameter.
1—77" face x 42" diameter—with gear.
1—64" face x 36" diameter.
18—28" face x 38" diameter, complete with 2 deck frames, gears, bearings and steam joints. Drives, line shaft and felt rolls are available.
1—78" face x 18" diameter with gears and bearings.
2—48" face x 24" diameter—chromium plated.
1—120" face x 16" diameter—Baby Dryer.
11—44½" face—36" diameter with 2 deck frames, gears and bearings.
3—63¼" face—36" diameter—bearings and gears.
2—82¼" face—36" diameter—bearings and gears.
6—96" face x 48" diameter.
95—126" face x 42" diameter.

EXTRACTOR ROLLS—VACUUM

1—Downingtown—64" face x 17" diameter with bearings & stand.

FLAT SCREENS

5—10 plate Sandy Hill.
1—Sandy Hill 8 plate—with scraper.
1—New Sandy Hill 12 plate, with scrapers, and V-belt drive.
1—Montague 6 plate—ball bearing.

FOURDRINIER SECTIONS

1—P & J 136" x 30 ft. ball bearing. Complete from inlet to 22" diameter suction couch. Brass and Rubber covered table rolls. 6 Brass Suction Boxes operated at 1000' per minute.
1—M & W 82" x 40' complete with 3 suction boxes, shake, 3 section presses and size press.

HAMMERMILLS

1—American Hammermill—37" cast friction bearing sectional

HEAD BOXES

1—118" Bronze Lead Lined. Beloit.

INLETS

1—Voith Inlet for 151" wire with 28" slice. Complete, including drive.
1—96" All bronze—adjustable.
1—141" Beloit complete with distributor roll.

JORDANS

2—Jones Standard, with motor bases and couplings.
1—Jones Stangard—ball bearing direct connected to 150 h.p. G.E. 440 volt motor.
1—#3 Miami, for motor drive.
1—Jones Majestic, roller bearing—stainless steel filling—for motor drive.
4—Jones Majestics with base and couplings—bronze filled, 2 sets of new bronze fillings.
3—#3 Appleton with base and coupling—bronze filled.
1—Dillon Horse #2—direct connected 75 h.p. Stainless steel ⅛" filling.
1—#4 Smith & Winchester—Ball bearing.

MOTORS

1—Fairbanks Morse — 30 h.p. — 495 r.p.m. — 220/440/360.
1—Reliance 25 h.p. ball bearing, 550 v., 3 phase, 60 cycle—1750 r.p.m.
1—General Electric 150 h.p.—440 v.—3 phase—60 cycle—600 r.p.m.
1—General Electric 200 h.p. induction, 440 v. 3 ph. 60 cyc. 580 r.p.m. with GE starter.
1—General Electric 550 h.p. synchreneous type T8 440 v. 3 ph. 60 cyc. 400 r.p.m. with exciter GE starting panel.

PRESS ROLLS

1—118" face x 15" diameter—rubber.
1—101" face x 18½" diameter—rubber.
1—123½" face x 17½" diameter—rubber.
1—112" face x 15" diameter—rubber.
1—122" face x 17½" diameter—brass.
1—117" face x 24" dia.—Brass.
1—94" face x 20" dia.—Rubber.
1—178" face x 22" dia.—Rubber.
2—118" face x 21" dia.—Rubber.
1—147" face x 11¾" dia.—Rubber.
1—74" face x 18" diameter—Rubber.
1—109" face x 17" diameter—Rubber.
1—138" face x 22" diameter—Brass.
1—102" face x 18" diameter—Rubber.
1—119" face x 17" diameter—Brass.
1—78" face x 10" diameter—Brass.
1—53" face x 14" diameter—Brass.
1—33" face x 12" diameter—Iron.
1—35" face x 10" diameter—Iron.
1—74" face x 16" diameter—Iron.
1—71" face x 14" diameter—Iron.
1—102" face x 18" diameter—Brass.

PULLEYS

30—Split cast Iron tapered Pulleys.

PULP EQUIPMENT

1—Jigger—1 deck—vibrating screen.
1—Mills & Merrill #17 Pulpwood chipper.
1—5' Carthage Disc Barker
1—88" Carthage Ball Bearing Chipper—4 knife.

PULPERS

1—#2 Lannoye Pulpers

PUMPS

44—Centrifugal Pumps, Direct connected, Belt Driven. Extended base for motor. Assorted capacities and heads. Most used less than one year.

PUMPS—OPEN IMPELLER

1—Morris open impeller—9" suction—5" discharge—belt driven.
1—Morris Vertical Open Impeller 8 x 8—500 g.p.m. 5 percent stock—50' head—connected to G.E. 15 h. p. 220-440 volt 3 phase—60 cycle—1165 r.p.m.
1—New Gould—ball bearing—6" suction—4" discharge—700 g.p.m.—40' head. Requires 20 h.p. at 1750 r.p.m.
1—New Gould—ball bearing—8" suction—6" discharge—1500 g.p.m.—40' head. Requires 25 h.p. at 1150 r.p.m.
1—New Gould—ball bearing—8" suction—6" discharge—1200 g.p.m.—60' head. Requires 30 h.p. at 1150 r.p.m.
1—New Gould—ball bearing—8" suction—6" discharge—1000 g.p.m. 40' head. Requires 20 h.p. at 1160 r.p.m.
1—New Gould 6" suction 4" discharge 500 g.p.m. 40' head. Requires 15 h.p. at 1750 r.p.m.
1—Warren—10 x 6. 1000 g.p.m.—30' head—Belt driven.
1—Frederick—6 x 4. 400 g.p.m.—30' head—for motor drive.
1—Warren—4 x 3. 300 g.p.m. 30' head. Belt driven.
1—De Laval 6 x 8. 250 g.p.m. 30' head—for motor drive.
1—De Laval—6 x 6. 500 g.p.m. 30' head—for motor drive.

REELS

2—Beloit 110" two bowl Reel.
1—M & W 76" 2 bowl reel.
1—Beloit 132" two bowl upright reel.
1—Beloit 116" two bowl upright reel.

ROLLS

2—18" diameter x 120" face with ball bearings and stands. Bored for steam.
250—Brass, Steel Rolls, Assorted sizes.

ROTARY SCREENS

3—Jones Leitzwalk—cylinder 84" face x 28" diameter.
1—#2 Leith-walk-ball bearing.
1—#3A Bird with motor. Used less than 1 year.

SCREW PRESSES

3—Valley Voith Screw Presses Size 2A, with new spare sets of plates.

SHEETERS

3—Hamblet 51" Single Knife with 6 roll bank stands and motors.
1—Hamblet 81" Single Knife with 8 roll bank stands and motor.
1—Beloit Duplex 104", complete with drives.
1—Hamblet Duplex—136".

SHREDDERS

3—Sprout Waldron Cutters — type F-11 — 18" knives. Used 30 days.

SLITTERS AND WINDERS

2—Pusey & Jones 180" high speed slitters and rewinders.
1—New 208" Camachine 20. Operates up to 5000' per minute.
1—42" Cameron Model 6, with 15 slitters.
1—New 50" Cameron Model 6.

STUFF PUMPS

1—Beloit 10 x 20 triplex—with motors and chain drives.

SUCTION COUCH ROLLS

—Millspaugh 22" diameter x 138⅝" suction face.
1—Millspaugh 22" diameter x 138" drilled face.
1—Beloit 107" drilled face x 22" diameter. Anti friction bearings.
1—Millspaugh—14½" diameter x 93" drilled face.

SUPER CALENDERS

3—7 roll 62" face.
1—7 roll 63" face.
1—7 roll 56" face.

TRIMMERS

1—61" Seybold Precision with motor and five spare knives.
1—60" Undercut Trimmer.

VACUUM PUMPS

1—H2 Nash for motor drive.

YANKEE DRYERS

1—Beloit 10' diameter x 132" face with stands, gears, bearings and drive.
1—Beloit 12' diameter x 132" face with stands, gears, bearings and drive.

AMERICA'S LARGEST BUYERS OF PAPER MAKING MACHINERY

FOR SALE

1—Fourdrinier Machine. Voith inlet. Wire 121″ x 61′ 5½″. 22″ suction couch. One suction press—two conventional presses—one smoothing press. 21 dryers 60″ diameter, and four felt dryers 48″. One 8-roll and one 10-roll calender stack. One 2-drum upright slip belt reel. One 2-drum winder. Spiral bevel gear drives.

1—Fourdrinier Machine, wire 110″ x 60′. One Millspaugh 22″ suction couch. Two main presses, 29—dryers 48″ diameter. One 9-roll calender stack. One 2-spool reel. Bevel mortise gear drive.

1—Fourdrinier Machine. Wire 106″ x 55′ 10½″ long. Millspaugh suction roll—22″ diameter. Beloit shake. Two conventional presses. 26 dryers—48″ dia. x 102″ face, with double deck frames, bearings, gears. Calender stack. Reel Beloit uniform speed reel, drum 42″ x 102″. Winder, 2-drum Warren. Drives, Black-Clawson totally enclosed, with complete set of variable speed lineshaft.

1—Yankee Fourdrinier Machine, wire 90″ x 38′ 5″. Millspaugh suction couch. Yankee dryer 10′ 6″ diameter with pressure roll, frames, etc., 4 After Dryers 48″ x 96″. English type reel. Warren Winder. D. C. Driving motor.

1—Fourdrinier Machine, wire 81″ x 50′. Millspaugh suction couch. Two main presses. One lead dryer and 18 dryers 36″ diameter and two felt dryers. Three-roll calender. One two-spool reel. One M & W Winder. Spiral bevel gear drives.

1—6-cylinder machine, moulds 36″ x 100″ wide. Beloit suction drum roll. Four pair primaries. Three main presses. 66 dryers 42″ diameter. Two calender stacks. One Black-Clawson duplex cutter. One two-spool upright reel. Spiral bevel gear drives.

Cutters

1—78″ Hablet single cutter

1—109″ Hamblet duplex cutter

1—110″ Black-Clawson heavy duty cutter

1—110″ Beloit duplex cutter and slitter

1—114″ Beloit duplex cutter

1—116″ Dowingtown duplex cutter and slitter

1—124″ Beloit duplex cutter and slitter

Winders

1—116″ Moore & White—4-drum—will wind 60″ dia. rolls

1—120″—Warren—2-drum

Reels

1—144″—two-spool upright

1—116″—Uniform speed reel—Beloit

1—132″—2-spool — Black-Clawson—upright reel

Calender Stacks

1—5-roll Black-Clawson calender stack—54″ face

1—14″ dia.—3—8″ dia.—1—12″ dia. rolls

1—5-roll Lobdell calender stack—box type frame. Water cooled bearings—Dillon Doctors. 84″ face. 1—16″—3—10″—1—12″ dia. rolls.

1—5-roll heavy duty calender stack—84″. 1—16″—3—10″—1—12″ dia. rolls—10″ bored for steam.

1—7-roll heavy duty calender stack—82″ wide. 1—18″—5—12″—1—16″ dia. rolls—bored for steam.

1—5-roll heavy duty calender stack—92″ wide. —1—20″—3—12″—1—16″ dia. rolls—bored for steam.

1—9-roll heavy duty calender stack—92″ wide. 1—20″—2—14″—5—9″—1—12″ dia. rolls—bored for steam.

1—4-roll heavy duty calender stack—104″ wide

1—7-roll heavy duty calender stack—108″ wide

1—11-roll heavy duty calender stack—108″ wide

1—9-roll heavy duty calender stack—124″ wide

Several Hundred Calender Rolls—All Sizes—54″ to 143″ face

Super Calender Stacks

1—7-roll super calender stack—54″ wide

1—7-roll super calender stack—74″ wide

Dryers

34—M & W dryers—48″ x 126″

36—Dowingtown dryers—42″ x 126″—triple deck frames, bearings and gears

25—M & W dryers—36″ x 94″, with bearings, gears, double deck frames, all felt carrying equipment

27—M & W dryers—(7—36″ x 86″) with bearings, gears, (20—36″ x 82″) double deck frames and all felt carrying equipment.

Double Deck Frames

Black-Clawson double deck framework, gears, bearings for 12 dryers.

Presses

3—pr. 18″ x 86″ Press rolls complete with frames, housings and bearings

3—pr. 18″ x 96″ Press rolls complete with frames, housings and bearings. Have dryer section to match above press rolls

2—pr. 18″ x 108″ Press rolls complete with frames, housings and bearings

SHARTLE BROTHERS MACHINE CO.

MIDDLETOWN, OHIO

J-23

FOR SALE

Suction Rolls

3—Beloit suction presses—18″ x 72″

1—Millspaugh suction couch—14-9/16″ x 88″

1—Millspaugh suction couch—18″ x 110″

2—Downingtown suction presses—22″ x 124″ (New)

1—Millspaugh suction couch shell—22″ x 138″

1—Millspaugh suction couch—22″ x 140″

1—Beloit suction couch—30″ x 184″

Cylinder Moulds

11—Cylinder moulds—36″ x 124″, with 10″ diameter cast iron core. Shaft equipped for anti-friction bearings.

Extractor Rolls

1—Downington—24″ diameter x 123″ face extractor roll

1—Dowingtown rubber covered couch—17″ dia. x 124″ face, complete with framework, housings and bearings. New rubber covering on couch.

Beaters

1—Dayton iron tub beater—Roll—61″ dia. x 60″ face. Bandless keyed roll. Steel shaft. 60 bars, every other bar scalloped. 16″ outside operated dump valve. 6″ washout.

1—Dilts cast iron tub—1500# beater—roll 52″ x 52″

2—Dayton iron tub beaters—1 L. H. and 1 R. H.—roll 48″ dia. x 54″ face. R. H. roll has 66 bars. L. H. roll has 70 bars. Bandless keyed roll. Texrope drive. These beaters were just recently rebuilt.

Jordans

4—Noble & Wood Mammoth

1—#2 Miami—with 125 HP Crocker Wheeler Induction motor. 3 Ph.—60 cy.—440 volts 168—rated capacity—1050 CF. at 10″.

1—Jones Majectic

2—#2 Appleton

1—#1 Emerson

2—Jones Standard

4—Noble & Wood Monarchs

2—#2 Black-Clawson

2—Noble & Wood Pony

1—Noble & Wood Experimental

Classifiners

3—Dilts Classifiners

Flat Plate Screens

6—12-plate Packer screens—good condition

2—10-plate Harmon flat plate screens

1—10-plate Improved flat plate screen

Vacuum Pumps

2—#L9 Nash vacuum pumps

6—#L7 Nash vacuum pumps—mounted on common base, direct connected to Louis Allis—50 HP—3 ph.—60 cy.—440 volt motors. Silencers—Model—MUC—size—168—rated capacity—1050 CF. at 10″. Used 6 months. Perfect mechanical condition.

1—#L6 Nash vacuum pump—Air pressure and relief valve. Used less than a month. Is equal to new machine.

1—Connersville—12″ x 18″

1—Connersville—16″ x 24″

Wet Machine

1—72″—Rodgers wet machine — cylinder mould—48″ x 74″ face—couch roll—20″ dia. x 76″ face—felt covered—Presses—Top—Iron—16″ dia. x 73″ face—Bottom—Steel—18″ dia. x 78″ face—Felt rolls—17—76″ face—various diameters—Felt stretch. Complete with stands, frames, bearings, and housings.

Hydraulic Press Pumps

2—Single acting, Class K. H.—Pot valve & Pressure pumps. 1—1¾″ x 8″—49 RPM—1—2½″ x 10″—49 RPM

Wire & Felt Rolls

We have a very large stock of various size rolls of all types. 60—wire & Felt rolls—7″ dia. x 86″ face—A1 condition.

Drives

3—D. C. James herringbone right angle reducing drives—ratio—12.5—1 — almost new

2—Lewellyn drives—size 114—vertical—variable speed 3 to 1—almost new

1—Link Belt—VG-2—variable speed—ratio 2 to 1

1—Reeves variable speed drive—#4D—ratio 5 to 1

1—Reeves variable speed drive—#5E—ratio 4 to 1

1—Reeves variable speed drive—#5F—ratio 3 to 1

2—Falk—#6DB—ratio 36.05 to 1

3—Falk—#5DB—ratio 29.05 to 1

3—Falk—#5DB—ratio 24.47 to 1

Balers or Paper Presses

1—Ohio Cultivator Co.—size 17″ x 22″ paper press

1—Adco 17″ x 22″ paper press—#P-508

1—Economy's—27″ x 54″—by third dim. up to 27″—#54

Grinder

1—112″—Seybold Knife Grinder

SHARTLE BROTHERS MACHINE CO.

MIDDLETOWN, OHIO

J-23

FOR SALE

FOR SALE

FOR SALE

FOR SALE

BALER
1—1000 lb. Economy with motor
1—Ohio
BEATERS
1—66 x 81" Jones iron tub with perforated backfall and ragger, new in 1946, new roll in 1945
1—62 x 88" Valley Iron Works iron tub
2—(800 lb. Jones breaker
2—Rabus, rolls 75 x 55", bronze filled
1—44 x 42" Jones
SUPER CALENDERS
1—108"; 1—82"; 1—74"; 1—60"
SHEET CUTTERS
1—130" Horne duplex with duplex layboy
1—124" new Hamblet with duplex layboy and two 10 roll backstands which take 50" dia. rolls
1—104" Beloit duplex
1—100" Hamblet duplex with layboy
1—84" Clark with layboy
1—82" Dillon duplex with folder
1—80" Hamblet
1—70" Hamblet with layboy
1—64" Hamblet with ten roll backstand
REAM CUTTERS
1—56" Smith & Winchester
1—50" Oswego
1—48" Acme
1—39" Seybold
DRYERS
1—12 ft. x 106" Yankee
1—50" Oswego
1—48" Acme
1—39" Seybold
DRYERS
1—12 ft. x 186" Yankee
1—12 ft. x 132" Yankee
2— 8 ft. 174" Yankee
1—42" x 89" Yankee
DRYERS continued
5—60 x 174"
3—48 x 118"
3—48 x 106"
2—42 x 73"
1—48 x 73"
Section of 21—36 x 76", new operating
Section of 16—36 x 62", new operating
Section of 15—48 x 48"
Section of 4—54 x 48"
Section of 2—36 x 40" copper
Section of 3—28 x 40"
EMBOSSING MACHINES
45" Dornbusch, three sets rolls
30" Waldron
28" Textile, three sets rolls
PASTING MACHINE
1—40" and 1—60"
PRESS PART
With rolls from 28" x 144" to 14" x 42" with frames, etc.
PULPER
1—Number 2 Lanneye
PUMPS
2—12 x 12" Goulds triplex
1—8 x 12" Goulds triplex
2—8 x 10" Goulds triplex
SCREENS
Bird No. 3 A
Bird No. 2 A
Bird No. 2
Bird B A
Jones Leith Walk
Moore & White
PAPER MACHINES
1—84" trim Tissue with 8 ft. dia. dryer
1—74" trim Fourdrinier with special bevel gear drive
WASHER CYLINDER (Octegon)
2—44" x 43½" Free with iron work
ROTOGRAVURE MACHINE
1—28" with 21 motors, excellent, five color, anti-friction

FRANK H. DAVIS CO. 175 Richdale Ave., Cambridge, Mass. TF

FOR SALE: Two 50 x 72 Babcock sheet feed two-color Rotary Presses, with extension delivery and Dexter suction pile Feeders and A. C. motor equipment. Immediately available, in fine condition. Produce highest-grade four-color register work. Offered at wonderful saving, as room must be made for new presses. Thomas W. Hall Company, Box 520, Stamford, Conn. Stamford 4-3139. J-30

FOR SALE: One Brand New Potdevin #102 Flat and Square Bag Machine, making bags from ¼ lb. to 6 lbs. Immediate delivery. For further particulars address Box #49-313 care Paper Trade Journal. J-23

PAPER COATING MACHINERY MANUFACTURERS — Waxing, Oiling, Carbon, Laboratory Coating and Treating Machines. New improvement. MAYER MACHINE COMPANY, Inc., 1313 Buffalo Road, Rochester 11, N. Y. TF

FOR SALE—106" Beloit 4 Ply Board Paster with 72" cut-off knife or with larger knife if necessary. Priced right for immediate sale. Address Box 49-246 care Paper Trade Journal. TF

FOR SALE—Two Hoe Folders, shear cut, Model #1766 and one double French make folder. All in good working condition. Will sell at fair price. L. J. Gold, 5151 N. Lake Drive, Milwaukee, Wis. WOodruff 2-3875. J-30

FOR SALE—13 Wet Machine Felts—28' x 72" (Shuler and Benninghofen—Style 76). All new and in original wrapping. Located in New York State. Advise best offer. Address Box 49-290 care Paper Trade Journal. J-23

STOCK, FIXTURES & ACCOUNTS of southern coarse paper house for sale at replacement cost. Address Box 49-270 care Paper Trade Journal. J-30

FOR SALE—Equalizers or wire wound Doctor Rods for paper coating machines. Precision wound on ⅛, ¼, ⅜ & ½ rods with spring steel music wire. DE NEVE & CONSLER CO., P. O. Box 817, Rochester 3, N. Y. J-23

WANTED

DESIRE TO PURCHASE

Medium size paper jobbing-distributing business in New York City Area or near vicinity.

Must be going business with good reputation. All replies confidential.

Address Box 49-305 care Paper Trade Journal. J-23

WANTED

WANTED

Titaniums—Glycols
Alkalies—Waxes—Solvents
Colors—Oils—Residues, etc.

Chemical Service Corporation
86A Beaver St., New York 5, N. Y.
J-23

WANTED—W & P Shredders, Evaporator Generators and Boilers, Slitters, Cutters, Hydraulic presses, Sheridan Presses, Dryers. Address Box 49-273 care Paper Trade Journal. TF

PAPER MANUFACTURER desire to purchase or invest in converting business of standard paper products. Address Box 49-274 care Paper Trade Journal. TF

WANTED—Brightwood Box Machine. Address Box 49-275 care Paper Trade Journal. TF

WANTED—WAXING MACHINE for roll cardboard. Minimum width 40", maximum 60". Calipers .014 to .030. Reply Box 49-306 care Paper Trade Journal. J-23

WANTED—Modern Embossing Machine of Dornbusch or Waldron type. Advise width and full information regarding rolls, condition, etc. Write Box 49-310 care Paper Trade Journal. J-7

WANTED—52" Beck Sheeter—late model for light weight papers—spot cutting equipment with sheet supporting fingers and top and bottom tapes. Address Box 49-312 care Paper Trade Journal. J-23

SALES REPRESENTATION

SALES REPRESENTATIVE, single, thirty-four, desires industrial sales position, salary and expenses, prefer continuous traveling with an active established company. Address Box 49-265 care Paper Trade Journal. TF

FREE STORAGE

FREE STORAGE

of your Used Surplus Equipment in our 80,000 sq. ft. warehouse when consigned to us for resale. Write for details.

ROSS PAPER MACHINERY COMPANY
265 Passaic Street, Newark, N. J.
Tel. HUMBOLT 2-2177 TF

BUY

U. S.

SAVINGS

BONDS

FOR SALE

1—New Downingtown Suction Press roll, 24" diameter by 110" drilled face. Rubber Covered. Complete with anti-friction bearings.

CAMERON SLITTERS

1—42" Type 40.
1—42" Type 6 with constant tension device and slitter grinder.
1—50" Type 28 Model 3D Duplex.
1—52" Type 8-S.
1—62" and 1—65" Type 9.
1—62" Type 10-S.
3—62" Type 40-1AF.
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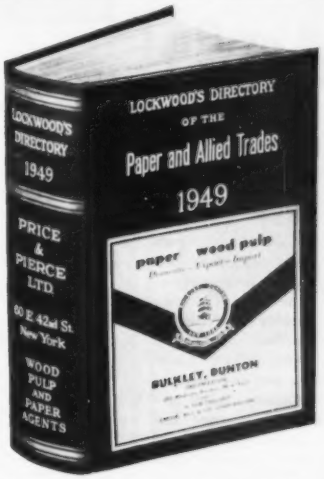

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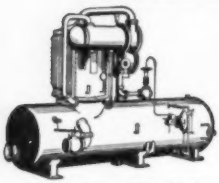

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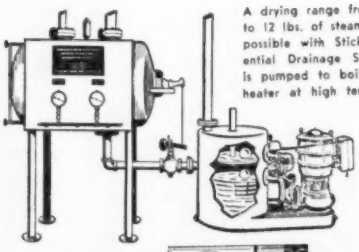

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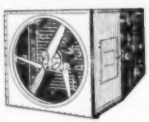

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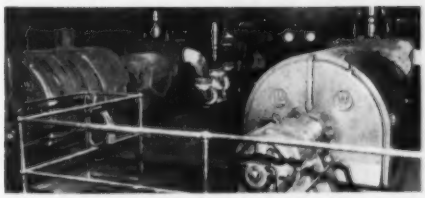

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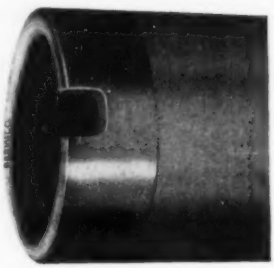

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Black-Clawson Co.
Downingtown Mfg. Co.
The Moore & White Co.
Noble & Wood Machine Co.
Oliver United Filters, Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

FREENESS TESTERS
Testing Machines, Inc.

GASKETS
The Goodyear Tire & Rubber Company

GEARS
American Manganese, Steel Div.
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Link Belt Company
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Suburban Machine Co.
Valley Iron Works Co.
Waldron Corp., John
Westinghouse Electric Corp.

GRINDERS
Carthage Machine Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Lobdell Co.
Norton Company
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
Norton Company

GUIDES, WEB
Askania Regulator Company
The Moore & White Co.
Mount Hope Machinery Co.
Bound Brook Engrg. Co.

GUMS
National Starch Products Inc.
Stein-Hall Co., Inc.

HEADS
Babcock & Wilcox Co.
Lukens Steel Company

HEAT EXCHANGERS AND RECOVERY SYSTEMS
William Allen Son's Company
Davis Engrg. Corp.
Foster Wheeler Corp.
Midwest-Fulton Machine Co.
Stickle Steam Specialties Co.
Westinghouse Electric Corp.

HEATING, VENTILATING & AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
Cochrane Corp.
Davis Engrg. Corp.
E. D. Jones & Sons Co.
General Electric Co.
Leeds & Northrup
Minneapolis-Honeywell Regulator Co.
D. J. Murray Mfg. Co.
Red-Ray Mfg. Co., Inc.
Ross Engineering Corp., J. O.
Stickle Steam Specialties Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

HOSE (Air, Water, Suction, etc.)
The Goodyear Tire & Rubber Company

IMPREGNANTS
American Anode Div., The B. F. Goodrich Chem. Co.

INDUSTRIAL TRACTORS
Clark Equipt. Co., Clark Tractor Div.
Towmotor Corp.

INK GRAVURE
Gotham Ink & Color Co.

INSTRUMENTS, TESTING AND MEASURING
Askania Regulator Company
Bauer Brothers Co.
N. P. Bowsher
The Bristol Company
The Brown Instrument Co.
E. J. Cady Company
Cochrane Corp.
The Foxboro Company
General Electric Company
W. & L. E. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Photovolt Corp.
Taylor Instrument Cos.
Testing Machines, Inc.
Williams Apparatus Co., Inc.

JOINTS
Johnson Corp.
Perfecting Service Corp.

JORDAN FILLINGS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
Heppenstall Company
E. D. Jones & Sons Co.
The Moore & White Co.
Taylor Stiles & Co.
Valley Iron Works Co.

KNOT BORING MACHINES
DeZurik Shower Company

LABORATORIES
Timber Engrg. Co.

LABORATORY EQUIPMENT
William Allen Son's Company
Appleton Machine Co.
Bauer Brothers Co.
The Biggs Boiler Works Co.
Bird Machine Company
Dilts Machine Works
W. & L. E. Gurley
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Taylor Instrument Companies
Testing Machines, Inc.
Valley Iron Works Co.

LAY BOYS
Gibbs-Brower Company, Inc.
Hamblet Machine Co.
Moore & White Co.
Suburban Machine Co.

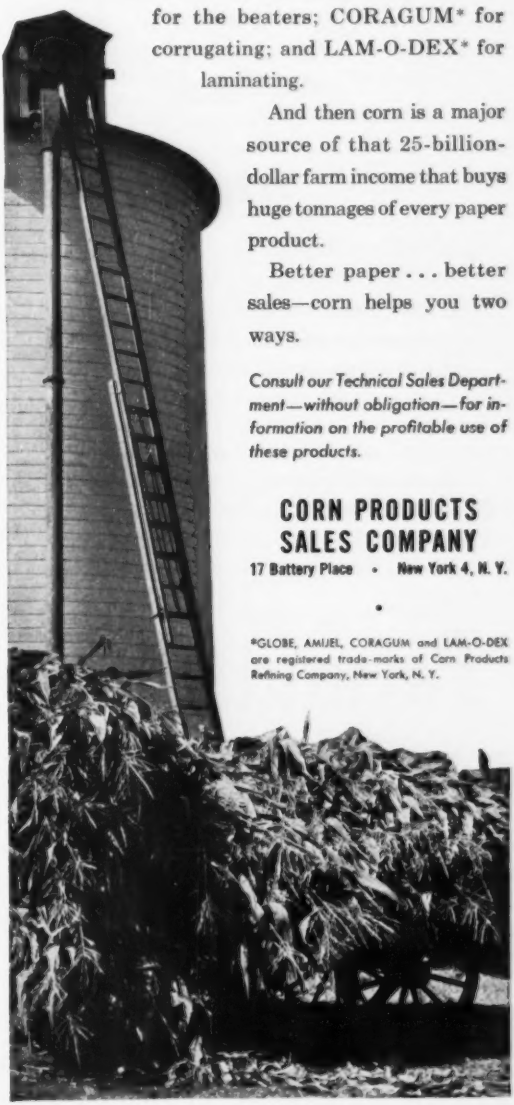
Bumper Crop—for you as well as the farmer

Corn plays two big roles in the paper industry. From corn come materials that help you make better paper more efficiently and economically—such materials as GLOBE* Starch for the beaters and for enzyme conversion; AMIJEL* for the beaters; CORAGUM* for corrugating; and LAM-O-DEX* for laminating.

And then corn is a major source of that 25-billion-dollar farm income that buys huge tonnages of every paper product.

Better paper . . . better sales—corn helps you two ways.

Consult our Technical Sales Department—without obligation—for information on the profitable use of these products.



CORN PRODUCTS SALES COMPANY
17 Battery Place • New York 4, N. Y.

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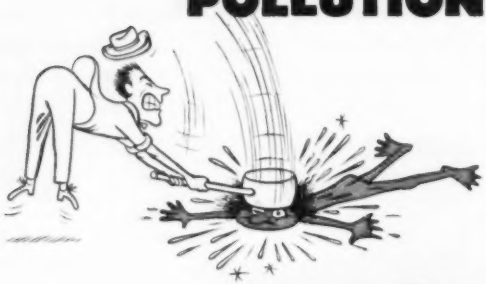
*GLOBE, AMIJEL, CORAGUM and LAM-O-DEX are registered trade-marks of Corn Products Refining Company, New York, N. Y.

You can eliminate STREAM POLLUTION

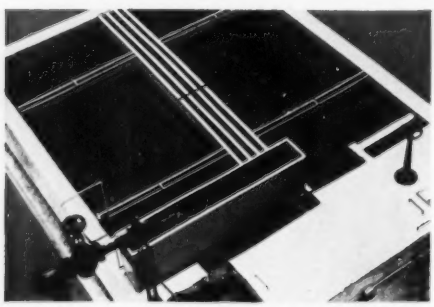


at a profit!

● The Permutit® White Water Reclaimer not only stops stream pollution...it reclaims pulp fibre and filler from water as well! This means more paper and more profits for *you!* And you are assured of a high quality process water which may be recycled again and again.

Why not turn waste into profit with this compact, economical unit? Just write to The Permutit Company, Department PT-6, 330 West 42nd Street, New York 18, N. Y., or to The Permutit Company of Canada, Ltd., Montreal.

Permutit *Water Conditioning Headquarters for Over 35 Years*



A typical installation of a Permutit White Water Reclaimer

WHERE TO BUY

LUBRICANTS
Sinclair Refining Co.
Socony-Vacuum Oil Co.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

MATERIALS HANDLING
Cleveland Crane & Engrg. Co.
Frank G. Hough Co.
The Wellman Engrg. Co.

MICROMETERS & CALIPERS
E. J. Cady Co.
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Co.
Testing Machines, Inc.
Walker-Goulard-Plehn Co.

MOISTURE CONTENT CONTROL
Askania Regulator Company
Midwest-Fulton Machine Co.
Stickle Steam Specialties Co.

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
Chicago Electric Company
Fairbanks, Morse & Co.
General Electric Company
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.

NICKEL AND NICKEL ALLOYS
The International Nickel Co.

NOZZLES
Link Belt Company

PACKING BOXES
Johnson Corporation
The Moore & White Co.
Perfecting Service Corp.
Shartle Brothers Machine Co.

PAINT
American Marietta Co., Valdura Division

PAPER MACHINES
Bagley & Sewall Co.
Black-Clawson Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Lukenweld
Moore & White Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

PAPER MACHINE SLICES
Black-Clawson Company
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson Sharp Machine Co.
Langston Co., Samuel M.
Suburban Machine Co.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Dilts Machine Wks.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

PENSTOCKS
The Biggs Boiler Works Co.

PERFORATED METAL
Allis-Chalmers Mfg. Co.

PIPE
American Cast Iron Pipe Co.
Armco Drainage & Metal Products, Inc.
Babcock & Wilcox Co.
Crane Company
Michigan Pipe Co.
Michigan Steel Casting Co.
National Tube Co.
Walworth Company
Youngstown Welding & Engrg. Co.

PIPE FITTINGS
American Cast Iron Pipe Co.
The American Rolling Mill Co.
Crane Company
Ladish Company
Michigan Steel Casting Co.
Phoenix Products Co.
Walworth Co.

PIPE MARKERS
W. H. Brady Co.

PITCH CONTROL
General Dyestuff Corp.
Monsanto Chemical Company
Rohm & Haas Co.

PLATERS
Gibbs-Brower Company, Inc.
Perkins & Son, Inc., B. F.

PLATES
Armco Steel Corp.
Babcock & Wilcox Co.
The Biggs Boiler Works Co.
J. O. Ross Engrg. Corp.
Lukenweld
Lukens Steel Company
Timken Roller Bearing Co.

PLUGS
The Appleton Machine Co.
Black-Clawson Company
E. D. Jones & Sons Co.
Shartle Brothers Machine Co.

PRECISION SAMPLE CUTTER
Testing Machines, Inc.

PRESERVATIVES
E. I. du Pont de Nemours & Co.
General Dyestuff Corp.

PRESSURE VESSELS, STEEL AND ALLOY
William Allen Son's Company
Babcock & Wilcox Co.
The Biggs Boiler Works Co.
Combustion Engrg. Co., Inc.
Foster Wheeler Corp.
The Midvale Company

PRESSES
Black-Clawson Company
Dietz Machine Works
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
The Moore & White Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.
Waldron Corp., John
H. G. Weber & Co., Inc.
Williams Apparatus Co.

PULP CLASSIFIER
The Bauer Bros. Co.

PULP STOCK VALVES
Crane Company
Record Fdy. & Mach. Co.
Shartle Bros. Mach. Co.

PULPERS
American Paper Mchy. & Engrg. Works, Inc.
Bauer Brothers Co.
Dilts Machine Works
Midwest-Fulton Machine Co.
Shartle Brothers Machine Co.

PULPS
Brown Company
Bulkley, Dunton Pulp Co., Inc.
Gotteaman & Co., Inc.
Elof Hansson, Inc.
Lyddon & Co. (America), Inc.
Parsons & Whittemore, Inc.

Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.
Pulp Sales Corp.

PULPSTONES

Norton Company

PUMPS

Allis-Chalmers Mfg. Co.
American Manganese, Steel Div.
Black-Clawson Company
Buffalo Pumps, Inc.
Byron Jackson Co.
DeLaval Steam Turbine Co.
Dorr Company
Downingtown Mfg. Co.
Fairbanks, Morse & Co.
Frederick Iron & Steel, Inc.
Gibbs-Brower Company, Inc.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Paper Converting Mch. Co.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Company

RADIANT BURNERS

Red-Ray Mfg. Co., Inc.

RAG COOKING PROCESSES

Adel Chemical Co.
William Allen Son's Company
The Kinsley Chemical Company
General Dyestuff Corp.
Rohm & Haas Co.

RAG CUTTERS

Gibbs-Brower Company, Inc.
B. F. Perkins & Son, Inc.
Taylor-Stiles & Co.

RECAUSTICIZING PLANTS

The Dorr Company

RECOVERY SYSTEMS

William Allen Son's Company
Babcock & Wilcox Co.
Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones Corp.
Ross Engineering Corp., J. O.
Valley Iron Works Co.

REELS

The Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Hudson Sharp Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

REFINERS

Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
Gibbs-Brower Company, Inc.
E. D. Jones & Sons Co.
Midwest-Fulton Machine Co.
Morden Machines Co.
Murray, D. J., Mfg. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS

Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Bristol Company
DeZurik Shower Company
The Foxboro Company
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
Midwest-Fulton Machine Co.
Minneapolis-Honeywell Regulator Co.
National Technical Laboratories
Shartle Brothers
Stickle Steam Specialties Co.
Taylor Instrument Companies
Wallace & Tiernan

RESEARCH CHEMISTS

Timber Engrg. Co.

RESINS

American Cyanamid Company, **Industrial Chemicals Division**
The Iron Chemical Company
The Goodyear Tire & Rubber Company
Hercules Powder Co.
Monsanto Chemical Company
Rohm & Haas Co., Resinous Products Div.

ROLLS

American Cast Iron Pipe Co.
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Lobdell Co.
Edward J. McBride
The Midvale Company
The Moore & White Co.
D. J. Murray Mfg. Co.
Perkins, B. F., & Sons Co.
Philbrick Engrg. Corp.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John
The Youngstown Welding & Engrg. Co.

ROLL COVERS

The Cincinnati Rubber Mfg. Co.
The Goodyear Tire & Rubber Company
Edward J. McBride
Stowe-Woodward, Inc.

ROLL STANDS

Cameron Machine Co.
Frank W. Egan & Co.
Moore & White Co.
Potdevin Machine Co.
John Waldron Corp.
H. G. Weber & Co., Inc.

ROPE CARRIERS

The Moore & White Co.

ROTARY BOILERS

The Biggs Boiler Works Co.

ROTARY STEAM JOINTS

Johnson Corp.
The Moore & White Co.
Perfecting Service Corp.

RUBBER PRODUCTS

The Goodyear Tire & Rubber Company

SATURANTS

American Anode Div., The B. F. Goodrich Chem. Co.

SATURATING MACHINES

Black-Clawson Company
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

SAVEALLS

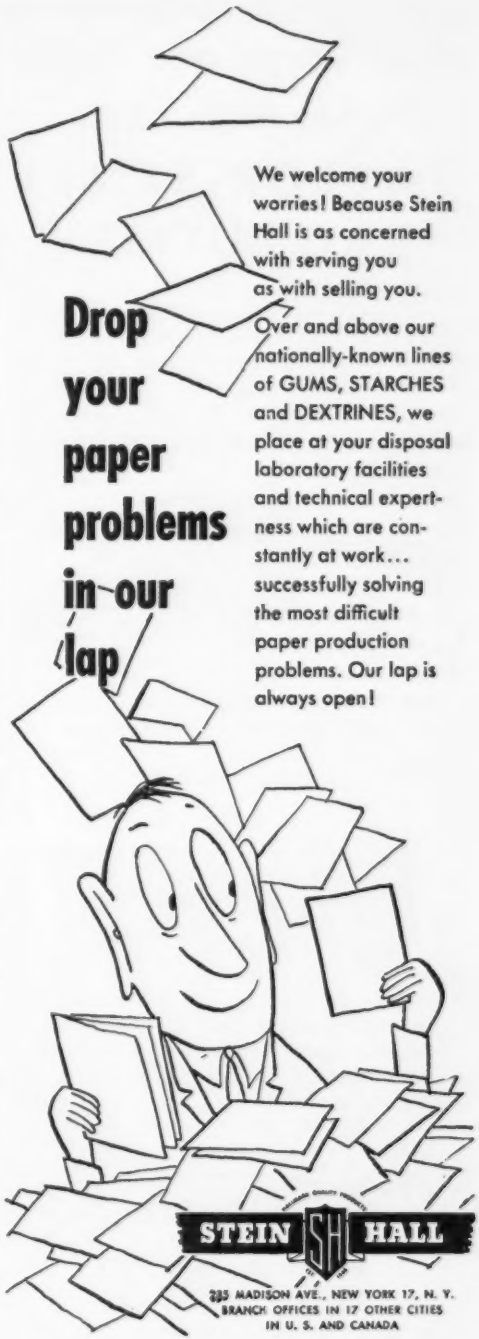
Bird Machine Company
Hardinge Company

SCALES

Fairbanks, Morse & Co.
Merrick Scale Mfg. Co.
Testing Machines, Inc.
Walker-Goulard-Plehn Co.

SCREEN PLATES

Bird Machine Company
Fitchburg Screen Plate Co.


Drop your paper problems in our lap
We welcome your worries! Because Stein Hall is as concerned with serving you as with selling you.
Over and above our nationally-known lines of GUMS, STARCHES and DEXTRINES, we place at your disposal laboratory facilities and technical expertness which are constantly at work... successfully solving the most difficult paper production problems. Our lap is always open!
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285 MADISON AVE., NEW YORK 17, N. Y.
BRANCH OFFICES IN 17 OTHER CITIES IN U. S. AND CANADA

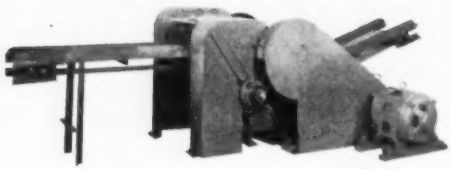
YES! GO WEST!
1949 Fall Meeting TAPPI
Portland, Oregon

Both Large and Small Paper Mills Use —

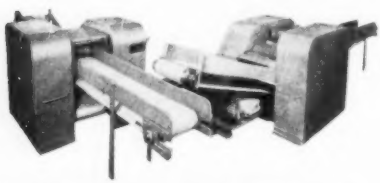
TAYLOR-STILES RAG CUTTERS

The size range of these efficient cutting machines—one ton to five tons an hour—provides for all capacity needs of paper manufacture.

TYPICAL TAYLOR-STILES CUTTERS ARE—



NO. 1 RAG CUTTER—Capacity, one ton an hour. This fine machine compares in every way with our big five-tons-an-hour cutters.



NO. 36 TANDEM RAG CUTTER—Cross cuts the rags for greater uniformity in the size of cuttings. Capacity one and one half tons an hour.

TAYLOR, STILES & COMPANY
TRADE MARK
GIANT
REG. U.S. PAT. OFF.
RIEGELSVILLE, N.J. U.S.A.

WHERE TO BUY

Magnus Metal Corp.
Morey Paper Mill Supply Co.
Testing Machines, Inc.

SCREENS
Allis-Chalmers Mfg. Co.
American Paper Machy. & Engrg. Works, Inc.
Appleton Wire Works
Appleton Machine Company
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Link Belt Company
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SHEET MACHINES
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Suburban Machine Co.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
DeZurik Shower Company
Downingtown Mfg. Co.
Moore & White Co.
Sandusky Fdy. & Mch. Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.
Gibbs-Brower Company, Inc.

SIZING
American Cyanamid Company, Industrial Chemicals Division
Black-Clawson Company
The Dow Chemical Company
du Pont, E. I., de Nemours & Co.
Glidden Company
Hercules Powder Co.
The Hubinger Co.
Monsanto Chemical Company
National Aluminate Corp.
Philadelphia Quartz Co.
Stein-Hall Co., Inc.

SIZING TESTER
W. & L. E. Gurley

SLIME CONTROL
W. A. Cleary Corp.
The Dow Chemical Company
E. I. du Pont de Nemours & Co.
General Dyestuff Corp.
National Aluminate Corp.
Rohm & Haas Co.

SLITTERS
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Co.
Langston Co., Samuel M.
Machinery & Prod. Engrg. Corp.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Suburban Machine Co.
Valley Iron Works Co.
Waldron Corp., John

SMOKE STACKS
William Allen Son's Company
The Bigga Boiler Works Co.

SPLICING TISSUE
Williams-Gray Co.

SOFTNESS-STIFFNESS TESTER
W. & L. E. Gurley
Testing Machines, Inc.

SOLUBLE OILS
Adell Chemical Company
American Cyanamid Company, Industrial Chemicals Division
General Dyestuff Corp.
Nopco Chemical Co.

SOLVENTS
Adell Chemical Company

STAINLESS STEEL
American Cast Iron Pipe Co.
Armco Steel Corp.
Michigan Steel Casting Co.
The Midvale Company
U. S. Steel Corp.

STARCH
American Cyanamid Company, Industrial Chemicals Division
A. M. Meincke & Son, Inc.
Clinton Industries, Inc.
The Hubinger Co.
National Starch Products Inc.
Stein-Hall Co., Inc.

STEAM JOINTS
The Moore & White Co.

STEAM SPECIALTIES
Babcock & Wilcox Co.
Cochrane Corp.
Combustion Engrg. Co., Inc.
Davis Engrg. Corp.
Johnson Corp.
Midwest-Fulton Machine Co.
Pertecting Service Corp.
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

STEEL
Allegheny Ludlum Steel Corp.
Armco Steel Corp.
Carnegie Illinois Steel Co.
Lukens Steel Company
Midvale Company
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
U. S. Steel Corp.

STEEL, CLAD
Babcock & Wilcox Co.
Lukens Steel Company

STEEL TANKS
William Allen Son's Company
The Bigga Boiler Works Co.

STRAPPINGS & STRAPPING MACHINES
The Stanley Works

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Midwest-Fulton Machine Co.
Moore & White Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOXES
Black-Clawson Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

SUCTION UNIT
Paper & Industrial Appliances, Inc.

SULPHUR
American Cyanamid Company, Industrial Chemicals Division
Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS
Valley Iron Works Co.

SULPHUR DIOXIDE
American Cyanamid Co., Calco Chemical Div.
Ansul Chemical Company
Virginia Smelting Co.

SUPERCALENDERS
The Appleton Machine Co.
B. F. Perkins & Son, Inc.

SYNTHETIC LATICES
American Anode Div., The B. F. Goodrich Chem. Co.
The Goodyear Tire & Rubber Company
Nopco Chemical Co.

TACHOMETERS
The Brown Instrument Co.

TALC
American Cyanamid Company, Industrial Chemicals Division
W. H. Loomis Talc Corp.

TANKS
William Allen Son's Company

WHERE TO BUY

The Biggs Boiler Works Co.
Cochrane Corp.
Kalamazoo Tank & Silo Co.
The Noble & Wood Machine Co.
B. F. Perkins & Son, Inc.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Waldron Corp., John

TEARING TESTERS
Testing Machines, Inc

TENSILE TESTERS
B. F. Perkins & Son, Inc.
Testing Machines, Inc.

THICKENERS, DECKERS AND SAVEALLS
The Appleton Machine Co.
Bird Machine Company
Bulkley, Dunton Pulp Co., Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Hardinge Co., Inc.
Moore & White Co.
D. J. Murray Mfg. Co.
Oliver United Filters, Inc.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Valley Iron Works Co.

TIMBER ROOF TRUSS DESIGNS
Timber Engrg. Co.

TITANIUM
American Cyanamid Co., Calco Chemical Div.
E. I. du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.
Witco Chemical Company

TOOLS
Ingersoll-Rand Co.
The Stanley Works
Walworth Company

TRACTOR SHOVELS
Frank G. Hough Co.

TRACTORS & TRUCKS
Frank G. Hough Co.
Towmotor Corp.
Clark Equipt. Co., Clark Tractor Div.

TRANSMISSIONS
Link Belt Company

TRAPS
Armstrong Machine Works
Cochrane Corp.
Crane Co.
Johnson Corporation
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

TUBES
Babcock & Wilcox Co.
National Tube Co.

TUBING, MECHANICAL
National Tube Co.

TUBS
Rodney Hunt Machine Co.
Shartle Brothers
Valley Iron Works Co.

TURBINES
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Company
Hunt, Rodney, Mach. Co.

TURPENTINE RECOVERY
Foster Wheeler Corp.

USED EQUIPMENT
Frank H. Davis Company
Gibbs-Brower Co.
Thomas W. Hall Co.
J. J. Ross Company
Ross Paper Machy. Corp.
Shartle Brothers Machine Co.
Suburban Machine Co.

VALVES
Askania Regulator Co.
The Bristol Company
The Brown Instrument Co.
Cochrane Corp.
Crane Company
Dilts Machine Works
The Foxboro Company
E. D. Jones & Sons Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
William Powell Co.
Record Fdy. & Mch. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
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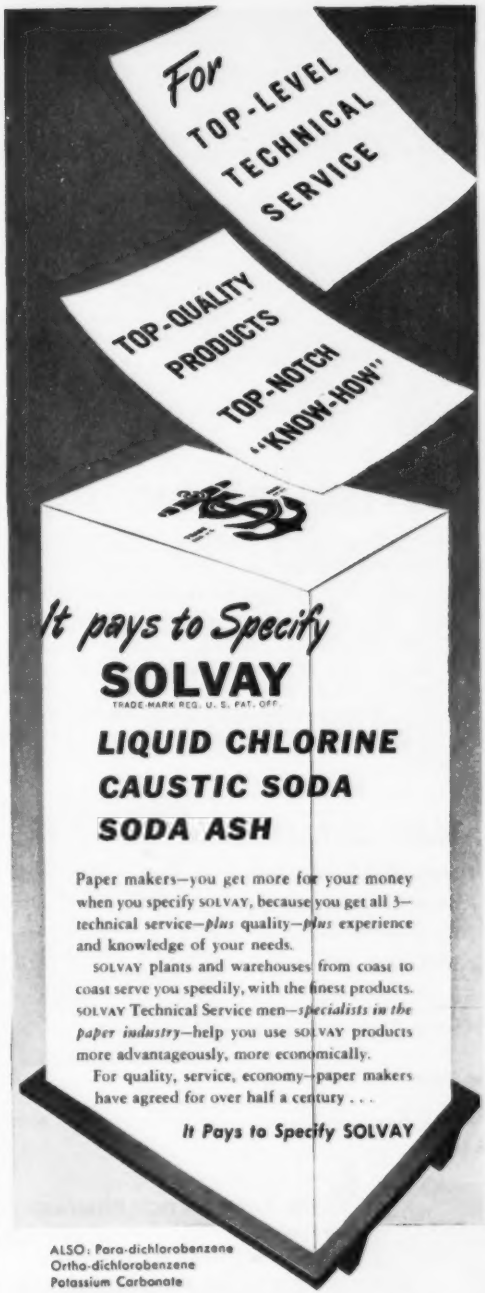
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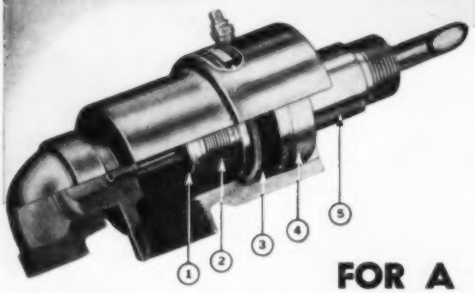

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